2002 CALIFORNIA STATEWIDE MULTIFAMILY PROGRAM EVALUATION

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1. EXECUTIVE SUMMARY

This report summarizes the results of the 2002 California Multifamily Energy Efficiency Rebates Program (MFRP) evaluation. Before 2002, incentives for multifamily properties were provided through a combined single and multifamily Residential Contractor Program (RCP) that used the contractor channel to target this market. The level of participation by multifamily properties was very low, however. Hence, in 2002, the utilities created a separate Multifamily Energy Efficiency Rebates Program to provide opportunities for this underserved sector to participate more fully and directly in the portfolio of utility energy efficiency programs. The MFRP is a statewide program operated by each of the four California investor-owned utilities[1] (IOUs) using a uniform set of program guidelines and incentive levels. The MFRP provides rebates for a broad list of energy efficiency measures that can be installed in apartment dwelling units and in the common areas of apartment and condominium complexes.

1.1 Evaluation Approach

The MFRP was essentially a new effort in 2002 and a key priority for this evaluation was to assess the operational and marketing components of the program. A secondary objective was to assess the assumptions used in the program savings estimates. To meet these objectives, the evaluation research included a series of discrete tasks:

- **Process Evaluation**. The evaluation team conducted a review of program literature and interviews with Program Managers and other parties.
- **Contractor Interviews**. In-depth interviews were conducted with 19 firms providing services to the MFRP. Also interviewed were 16 non-participant contractors and eight suppliers and distributors of gas products.
- **Owner/Property Manager Interviews**. The team conducted 19 in-depth interviews with participant property owners/managers and eight interviews with non-participant property owners.
- **Owner/Property Manager Surveys**. Three hundred 300 telephone surveys were completed, 150 with program participants and 150 with non-participant properties.
- **On-Site Verification**. The team completed 126 on-site verifications of 2002 participants.
- **Impact Savings Assessment**. The results of the other research were used to assess the validity of the savings estimates for the program.

[1] The four investor-owned utilities are Pacific Gas & Electric, Southern California Edison, San Diego Gas & Electric, and Southern California Gas Company.

- **Hard-to-Reach Assessment.** A geographic information system was built to determine where the program participants for PY2002 were located. The underlying U.S. 2000 Census was then used to determine their characteristics.

1.2 Overall Assessment

Unlike the earlier Residential Contractor Program, this program is intended to target property managers and owners directly. The individual utilities made numerous efforts to attract the attention of property managers/owners using such methods as direct mailing, cold calling of large customers, and teaming with local building owner/manager trade associations. Although these efforts had some success, a few large contractors who solicited to property owners were responsible for most of the applications received.

Interested parties, whether they were contractors or owner/managers, submitted program applications using the standardized forms. In 2002, these applications were processed on a first-come first-serve basis with no limitations imposed and no reservation system. A reservation system was implemented for 2003. In 2002, some measures, such as lighting, were fully subscribed quickly. Each utility acted individually in deciding whether to allocate funds earmarked for other applications to cover the excess lighting measure demand. Each utility processed, paid, and tracked its own applications. San Diego Gas & Electric (SDG&E) conducted post-installation inspections on every one of its applications. The other utilities performed inspections on approximately 5% of their applications.

Table 1.1 shows the number of applications submitted in PY2002. These numbers include projects where funds were committed before the end of PY2002, but final processing of the rebate took place in early 2003. It does not include projects where funds were committed in 2002, but later cancelled because the job was not completed or was delayed past the final PY2002 report filing date, except where noted.

Table 1.1: PY2002 Number of Paid Applications

Rebates				
	Rebate Total	**Paid Rebates**	**Committed Rebates**	**Canceled Rebates**
SCG	$530,682	$461,695	$54,674	$14,313
SDGE	$1,122,927	$1,102,387	$18,500	$2,040
PGE	$1,062,567	$985,722	$76,845	N/A
SCE	$1,147,976	$852,708	$295,268[1]	N/A
Jobs				
	Total Number of Applications	**Paid Applications**	**Committed Applications**	**Canceled Applications**
SCG	232	191	25	16
SDGE	140	135	4	1
PGE	224	165	59	N/A
SCE	307	173	134	N/A

[1] Does not include $ spiff payments to contractors for CFLs or torchiere returns.

As a newly designed program intended to target largely untapped markets, the MFRP was likely to encounter numerous challenges. Much to the credit of the program management team, the PY2002 program was not only designed and initiated but, most importantly, was operated successfully with funds fully subscribed on the electric side. The program's success in PY2002 led program managers to initiate a reservation system and adjust some of the rebate levels for PY2003.

Most contractors and property managers found the program process, paperwork requirements, and payment processing tolerable, but did appreciate the efforts made to streamline these processes for the 2003 program. The major concerns that were voiced centered on the program's timing in opening and closing and resulting the difficulty of obtaining funds for projects undertaken. In PY2002, the quick commitment of the available funds caught some contractors off guard. A reservation system initiated in PY2003 ensures that contractors have secured the rebate commitment before they begin a job. This change received widespread support among participating contractors.

It is worth noting that a number of the contractors who participated in the MFRP credited their activity in the multifamily sector to the existence of the program, either alone or in combination with other utility programs. Without the MFRP, it is clear that there would be less interest in serving the multifamily sector among some of the businesses that have been active in California efficiency efforts. This factor alone is noteworthy given the long history of difficulty in penetrating the multifamily market.

Some satisfaction issues arose with the program in 2002 with respect to jobs involving lighting measures. This area of problems is being monitored closely by contractors and utilities alike as the program moves forward and concrete steps have been taken to try to resolve past problems and prevent their recurrence. At least some of the problems encountered stem from inferior quality product in the marketplace; a factor which will bear scrutiny in the months to come.

The claimed savings made by each of the utilities, both electric and gas, were validated and accurately computed. Table 1.2 shows a summary of program savings.

Table 1.2: Summary of Program Savings

		Gross Filed Energy Savings	Net Filed Energy Savings	Net Energy Goals
Lighting (kWh)	All Utilities	10,577,445	8,814,121	N\A
	PG&E	2,439,382	2,171,050	N\A
	SCE	6,664,501	5,331,601	N\A
	SDG&E	1,473,562	1,311,470	N\A
Other Electric (kWh)	All Utilities	465,510	413,938	N\A
	PG&E	347,517	309,290	N\A
	SCE	104,194	92,367	N\A
	SDG&E	13,799	12,281	N\A
Total Electric (kWh)	All Utilities	11,042,955	9,228,059	17,406,489
	PG&E	2,786,899	2,480,340	6,116,005
	SCE	6,768,695	5,423,968	8,850,000
	SDG&E	1,487,361	1,323,751	2,440,484
Total Gas (therms)	All Utilities	581,411	517,456	1,563,569
	PG&E	78,932	70,250	708,970
	SCG	318,907	283,827	575,000
	SDG&E	183,572	163,379	279,599

PG&E = Pacific Gas & Electric
SCE = Southern California Edison
SCG = Southern California Gas Company
SDG&E = San Diego Gas & Electric

1.3 Key Recommendations

Within the context of this overall success, the evaluation identified the following issues and provides recommendations for PY2004 and beyond.

- Work with Contractors and Property Managers to Increase Lighting Retention,
- Restrict Lamp Installation to High Use Applications,
- Increase Program Funds,
- Adjust Rebate Levels,
- Create an Electronic Application,
- Market for Gas Applications,
- Develop a Hard-to-Reach Plan, and

1.3.1 Work with Contractors and Property Managers to Increase Lighting Retention

The biggest issue identified in this evaluation is the need to work with contractors, property owners, and lighting manufacturers to increase lighting fixture and lamp quality and increase the retention rate for lighting installed. The on-site inspections revealed that many lighting measures are being removed or are failing after installation. Fixing this issue is critical to the

success of this program, yet the solutions are complex and not ones that the MFRP Program Managers are in a position to solve independent of cooperation from the other parties involved.

There are a number of reasons why lamps that were reported installed are not found when inspectors visit the apartments a half a year to a year later. These reasons include:

- Lamps were never installed
- Lamps were in place but inspectors may not have identified them.
- Lamps burned out, and were not replaced,
- Lamps were removed by the property owner or tenant because they did not meet the needs of the tenant, or
- Lamps were removed by the tenant because they were relocating

Each of these reasons suggests different solutions for improving lighting retention, so below we offer specific recommendations as to how the program can improve the situation. As is explained in more detail in the On-Site Assessment Chapter, information is not available to quantify exactly which reasons are responsible for the lamps that were not found. There is some anecdotal information to suggest the relative importance of each of these reasons. There are a number of recommendations for future evaluations that will help quantify to what degree each of these issues is responsible for the missing lamps. These suggestions are included along with other recommendations provided below.

Improving lamp lifetime reliability. From the property manager surveys and discussions with contractors, it appears that the most important reason for lamps being removed is that the lamps are not achieving the expected lifetimes. This is an unexpected and troubling development; a solution to which extends way beyond the purview of this program. The program relies on the Energy Star label as the specification standard for lamps and fixtures. Though the Energy Star rating originally covered only the energy efficiency of the lamps, Energy Star has just recently been forced to delist some lamps because their reliability is below the expected lifetime range.[2] Energy Star is using the Program for the Evaluation and Analysis of Residential Lighting (PEARL) to help delist poor quality product. However, PEARL is currently only examining lamps sold at retail outlets and not those sold directly to contractors, which constitute most of the lamps installed in the MFRP. The MFRP program acted quickly to not permit any delisted lamps to receive rebates in the future. Unfortunately, the existence of less reliable product will continue to exist especially given the influx of imported lamps, and no specification standard or list exists that completely eliminates lamps with poor reliability.

Thus, the MFRP cannot be responsible for ensuring that all lamps purchased are reliable. This is the responsibility of the contractors and the manufacturers who supply them the product. Furthermore, the results of this on-site inspection and property manager survey may have been the first indication to the program and many of the contractors that lamp reliability was a serious issue.

Since disseminating these results in the fall of 2003, the evaluators have seen a number of encouraging developments taken by the program managers and the contractors to deal with the reliability issue.

[2] In report dated February 11, 2004, EPA delists 30 lamps effective March 11, 2004.

- Several of the largest contractors contacted all of the properties they had served and agreed to replace lamps that have prematurely burned out.
- Some contractors have begun giving additional lamps to use as replacements for lamps that have burned out.
- The Program Managers have met with the largest contractors to discuss the lamp retention issue.

Further development of these types of efforts are encouraged. While evaluations such as this can provide feedback to the contractors and the program about lamp reliability, it should really be the responsibility of the property managers to convey reliability issues to contractors, and contractors who take these issues to their suppliers. Yet, in the current arrangement, the property managers are ill informed about their responsibility, and not empowered to add any quality assurance assistance to the overall effort. MFRP can facilitate a more positive relationship between the property managers, contractors, and suppliers in the following ways.

- **Prepare a short manual for property managers that explains the program**. Greater attention must be given to the role that property managers can play in this program. Guidance that helps property managers select contractors and sign off on equipment installations would be very helpful in improving program quality. Several of the utilities are now mailing copies of the California Contractors State License Board publication "What You Should Know Before You Hire a Contractor." This is an excellent program enhancement. There is also a need for information specific to this program. The manual should outline the responsibilities and choices the property manager assumes in agreeing to participate. It should also explain the contractor's responsibilities and which channels to use to deal with possible problems. Specifically, property managers need to know that they and not the utilities have full responsibility for choosing the contractor and accepting their work. Contractors should give prospective property managers the manual, or utilities can mail the manual when the reservation is made. The manual should also be available upon request and available on the utilities' web pages. As part of the application, property managers should sign that they received this manual and understand the responsibilities they assume by accepting the rebate.

- **Build awareness of product warranties and enforce product warranties**. The biggest incentive for contractors to install quality products is to avoid costly returns for replacement or repair. The program needs to leverage existing product warranties by educating the property owners/landlord to require that contractors fix any products they install that fail before the warranty is completed. If possible, language stating this should be part of the application. If not, the brochure above should include language property managers can add to their agreements/work orders they negotiate with their contractors. The brochure should instruct property managers that while the utility assumes no responsibility for the contractors, the utilities would like to hear from property managers if problems with contractors arise.

- **Require information on both fixture and lamp type for each application**. Contractors have reported that some problems appear to stem from a batch of lamps with high failure rates from one manufacturer. Because these data are not collected, the evaluation team

cannot verify this claim. If this data were available, the utilities could closely monitor lamp issues at sites where these lamps are installed.

Lamp/fixture quality issues. Shorter than anticipated lamp lifetimes, however, is only one of the causes of the lamp removals. Our surveys and interviews revealed that some landlords and tenants removed lamps because the lighting quality or the fixture aesthetics were inadequate. When users complain about the quality of a lamp, they are most often complaining about the lighting level, though complaints may also reflect the color effects or lamp flickering. There were also concerns voiced about the aesthetic qualities of the fixtures and the sloppiness of the installations. The MFRP cannot institute any policy that can control these types of quality issues. It has to be the responsibility of the property managers to control these issues. Unfortunately, the property managers do not understand the issues involved in selecting lamps and fixtures, they are unaware of the various options available, and they are unaware that they have some choices in the types of product that can be installed in their apartments. Again the following recommendation can be done by MFRP to address lamp quality issues.

- **The manual for property managers should explain the choices that they can make in what equipment gets installed**. The manual should show the types of lamps/fixtures available, what wattage to choose, and other lighting issues.

- **Contractors whose work is tied to low participant satisfaction levels should be monitored closely**. If quality issue continue to be a big issue, then it may be necessary to move to greater control of contractors, and away from the rebate model. At that point, the use of performance bonds, withholding of portion of payment, and/or delisting of contractors who continue to have issues may be needed.

Lamps removed when tenant relocates. Property managers indicate that tenants leaving the properties took some of the missing lamps. Lamps that are removed and placed in new locations in the same utility continue to save the utility energy, though tracking this type of movement is difficult. The evaluations in the future should determine when lamps have been removed by relocating tenants and try to determine a new location for the tenant. However, if the tenant removal issue is significant, it may suggest that MFRP should rely more on fixtures, and less on screw-in lamps.

Lamps were never installed. The best way to ensure that lamps have been installed is to increase the number of utility-conducted in-field inspections of program rebate applications. These verifications confirm that measures are installed. These inspections are in addition to the applicants supplying invoices for the purchase of measures.

- In 2002, PG&E and SCE perform in-field inspections on approximately 5% of their rebate applications. These inspections should increase to include all applications over a certain number of measures and all large dollar-value rebate items. A higher percentage of the remaining applications should also be in-field inspected. This will reduce the chances of rebates being granted for measures that are not installed or removed soon after. Even though the on-site survey did not find clear evidence of this occurring, it is a possibility.

- SDG&E and SCG perform in-field verifications of 100% of their applications. SDG&E does this level of verification because they have found that at least 10% of the equipment is not installed.

Lamps were installed but inspectors could not find them. Clearer protocol need to be developed and adhered to to confirm that all sites pre-selected for inspection are in fact observed. Future evaluations will need a tighter set of protocols to eliminate this as an issue. In addition, future evaluations need to address retention issues for lighting measures uncovered during this evaluation. It is recommended that resources be allocated to perform the following:

- Conduct telephone interviews with tenants receiving CFLs in their apartments to more accurately determine the disposition of the CFLs and assess the tenants' satisfaction with these lamps,
- Conduct more surveys with property managers to understand better the disposition of CFLs and fixtures installed under the program.

1.3.2 Restrict Lamp Installation to High Use Applications

In PY2002, no restrictions were made on where or how many lamps could be installed in a unit. Lamps were installed in closets and other low use applications. Starting in PY2004, contractors are no longer permitted to install lamps in low use areas or install more than 8-10 lamps per unit. It is recommended that the 2004 program should monitor lamp installations to make sure that lamps are being installed in these applications as part of the verification process.

1.3.3 Increase Program Funds

One of the biggest issues confronting this program is over-demand, which forces electric funds to be subscribed within weeks of the program opening. If quality control is resolved, there is significant justification for increasing program funding, particularly as a resource acquisition endeavor. Replacing inefficient lighting in tenant spaces is a large untapped potential market with almost no free ridership.

1.3.4 Adjust Rebate Levels

Because the money is so quickly committed, there is pressure to lower the level of rebate per fixture so that more units can be installed. The PY2004 program lowers the fixture rebate from $60 to $50. Not surprisingly, the existing contractors voiced objections to this rebate change, and some said the change would make it unprofitable to install the fixtures. The evaluation team's concern is that the lowered rebate will squeeze the profit margins of these contractors. This pressure may encourage contractors to use lower quality products. Unless a quality control system is implemented, the results could be worse than those results experienced in PY2002. The existing mandate by the program that measures need to be Energy Star products only ensures that lamp efficiency is obtained. This does not cover aesthetics, light quality, or lifetime.

- **The program managers must closely monitor activity at the beginning of PY2004 to track both application rates and the types of lamps installed**. Program managers should recognize that it might take longer for contractors to find willing properties. Program managers need to give the program time to work. A few successful contractors is all it will take to overcome the complaints of those who cannot adapt. If applications

are seriously lagging, it will only take a few weeks at the old incentive level to subscribe the program fully again.

- **Contractors should be encouraged to see the reduction of incentives not as a call for lower quality equipment or less profit, but as a shift in program responsibility that requires properties to help pay for these improvements**. Again, this will be a harder sell than giving away free lamps, but there are many people willing to take the 80% discount. It will also make it easier for contractors to offer a variety of lamps with different aesthetic qualities. It is important that the program monitor the locations of the applications to determine if the co-pay cost is limiting applications from HTR areas.

1.3.5 Create an Electronic Application

One frequent suggestion from participating contractors was the availability of an electronic application form. An electronic process might eliminate or reduce some of the duplicative entry currently required for projects installing large numbers of the same measure in a project or large numbers of measures in one location. The PG&E electronic data entry set up is well regarded among those who have used it. Respondents felt that this electronic form offers a good model for the other utilities.

1.3.6 Market for Gas Applications

The lower level of participation for qualifying gas measures continues to be a concern for the program managers who have stepped up marketing to potential customers and contractors. Because gas measures generally represent technologies that are incremental improvements over existing products, the utilities cannot offer rebates that cover the full installation cost. Unlike the electric lighting measures where rebates often cover the full cost of the product and installation, the lower gas rebate levels generally limits the applications to those units that need replacement. To achieve full commitment of gas funds, the program will need to tap into the existing large replacement market by aggressively marketing this program to property managers, contractors, and product distributors. In so doing, it must be realized that the contractors who install gas measures have felt that, to date, the incentives offered by MFRP have been set at levels that are too low.[3] Outreach to contractors will need to address contractor expectations in this area, and leverage other means for generating contractor interest in program participation.

MFRP program promotion must address the additional barrier of low awareness among eligible property managers. It appears that this barrier is most acute among small and medium size property owners and managers.

In light of these findings, the following recommendations are offered for marketing the program, especially for greater gas measure activity. In 2003, some of these ideas have been tried with the utilities all meeting their 2003 goals.

- **The gas element of the MFRP should be structured to target replacement decisions rather than retrofit decisions.** In contrast with lighting measures where the costs of retrofitting an existing system can be very cost-effective from the consumer's

[3] Raising incentive levels would also have a negative effect on utilities in reaching their savings goals.

perspective, the cost of retrofitting an existing water heater or boiler is often prohibitive. Consequently, a consumer typically defers replacement until the unit fails or has reached the end of its useful life. Providing incentives to encourage early retirement of these units would be very costly. Consequently, incentives are usually too low for this type of market activity to occur. Gas efficiency incentives are, therefore, most useful to consumers at the time of equipment replacement. Importantly, the design of programs targeting replacement opportunities is fundamentally different from programs targeting retrofit opportunities.

- **To influence replacement decisions, the programs must increase marketing, outreach, and support efforts to property managers, contractors, and distributors**. Even if the gas market remains limited to equipment replacement opportunities, there are sufficient replacements each year to fill each utility's gas-measure goals. Unfortunately, the program suffers from low awareness among property managers. Even those who are aware do not always have enough information at their disposal to participate at the instant that equipment replacement becomes necessary. This suggests a need for steps for building awareness as well as a commitment to creating ready access to needed applications and detailed program information.

- **One essential recommendation is the need to commit to more extensive marketing of the program.** With the exception of SCG, virtually no funds were expended in 2002 for marketing purposes. Consequently, program activity was largely driven by contractor activities, with the involvement of larger lighting contractors leading to program greater activity on the electric side. To balance this in the future, the utilities should commit to more marketing and promotion on the gas side.

- **Potential focus areas for the gas element of the MFRP include the following:**

    - Developing a marketing plan for small and medium sized buildings,
    - Reviving relationships with distributors and suppliers as a means of reaching customers and contractors with information on new technologies, products, and program services,
    - Encouraging distributors/suppliers to work with equipment manufacturers to provide contractors with best practices training on new equipment, and
    - Supporting training at an accessible level for building maintenance staff on the important aspects of operating and maintaining new energy efficient equipment.

1.3.7 Develop a Hard-to-Reach Plan

- **The Program should concentrate on its primary hard-to-reach (HTR) goal to include multifamily and mobile home customers in the list of recipients of Public Goods Charges (PGC) funds.** The emphasis on secondary goals, such as marketing to rural or moderate-income households, detracts from the all-important goal of reaching multifamily units. Reaching the multifamily segment is a worthy goal in itself, as this segment has long been underserved. The MFRP is one of the first programs that bring any type of benefit to the tenants in these complexes. As such, the goal should be reaching the broadest possible market of multifamily customers.

- **The Program should stop concentrating attention in rural areas.** The goal to promote the program in rural areas is counterproductive. The analysis shows the problems a single program encounters when it tries to address all HTR issues simultaneously. The MFRP cannot cost-effectively and efficiently deliver a multifamily program targeted to rural areas because this is not where most multifamily households exist. As the program continues, it will be increasingly difficult to find non-participant multifamily complexes in these areas.

- **The program should market itself to areas with the greatest potential**. The program's goal should be to push into areas where there has been little activity and great potential for cost-effectively and efficiently targeting multifamily units. The geographic information system (GIS) is used to identify specific census tracts where large numbers of potential candidates are located. This is defined as areas with more than 250 multifamily households and larger than average numbers of families in the moderate-income range (>32%). Most of these tracts had no program activity in 2002.

- **The Program needs to use Census Tract-level data for identifying HTR clusters.** Using zip codes for targeting program emphasis is too crude in most cases: The utilities set their original target priorities by selecting a set of zip codes to include as HTR areas. In most cases, the zip code level is too aggregated of spatial measure to identify accurately HTR households from non-HTR households

- **HTR Achievement Must Be Assessed at the Portfolio Level**. The current CPUC emphasis of setting goals for individual programs and measuring achievement at the program level should be reassessed. The real measure of success must be how well the overall portfolio of programs reaches all segments of the population. Three important concepts are missing from the current CPUC policy approach.

    - To reach HTR sub-groups effectively will require programs tailored to attract that specific group. These programs will not be universally applicable to the broader set of utility customers. If the group reached by the program is indeed HTR, then the program is effective.
    - Each utility's accountability in addressing HTR should be assessed at the aggregate level and not by individual programs. The utilities themselves may set HTR for each program manager, but those goals should be drawn to bring the entire portfolio into compliance and not to try to make every program HTR neutral. Each utility should be developing a portfolio of programs that fairly distributes PGC funds across the entire class of customers. A good portfolio may contain some programs that are not very attractive to the HTR groups (new construction for example); as long as there are others included that specifically target these groups. Assessing each program individually ignores the purposeful targeting that is needed. In fact, as is the case here, it discourages programs from identifying underserved niches and marketing to them directly. Broad HTR goals applied across all programs individually will not create the type of targeted programs that will be most effective.

- There should be a balance between requiring each program to have a HTR goal and having programs exclusively designed for HTR. While in some program cases, it will be cost effective to serve HTR and non-HTR segments together due to economies of scale, in other cases programs may need to be specially designed for HTR. It may even be that such exclusive programs may be piggybacked on existing general population program.

- **Data on participation should be collected and assessed to design programs and redefine the exact composition of those who are HTR**. The analysis demonstrated here will give utilities important information on the distribution of benefits across the customers in their service territories. As these data become available, it is important that the definitions of HTR be refined to reflect the reality of who is and who is not participating. Over time and with better data, the CPUC and the utilities will be able to better define the HTR segments so that what now may be "all multifamily" may eventually be "moderate income, non-white occupied units," or units in specific census tracts. As the group is better defined, so too should the program design and marketing become more specific in its reach to these audiences.

2. INTRODUCTION

2.1 Evaluation Objectives and Methodology Overview

This report covers the 2002 California Multifamily Energy Efficiency Rebates Program (MFRP) evaluation. The MFRP was essentially a new effort in 2002. The main objective was assessing the program's operational and marketing components. A secondary objective assessed the assumptions used in the program savings estimates.

To meet these objectives, the evaluation undertook a series of research tasks.

- **Process Evaluation**. We conducted a review of program literature and interviews with Program Managers and other parties.

- **Contractor Interviews**. The evaluation team conducted in-depth interviews with 19 firms providing services to the MFRP. Sixteen non-participant contractors and eight suppliers and distributors of gas products also were surveyed.

- **Owner/Property Manager Interviews**. Nineteen in-depth interviews with participant property owners/managers and eight interviews with non-participant property owners were conducted.

- **Owner/Property Manager Surveys**. The evaluation team completed 300 telephone surveys: 150 with program participants and 150 with non-participant properties.

- **On-Site Verification**. The team completed 126 on-site verifications of 2002 participants.

- **Impact Savings Assessment**. Results from other research were used to verify the claimed savings for the program.

- **Hard-to-Reach (HTR) Assessment.** The evaluation team built a geographic information system to determine where the program participants for PY2002 were located, and then used the underlying U.S. 2000 Census to determine their characteristics.

2.2 Program Background

Before 2002, incentives for multifamily properties were administered through a combined single and multifamily Residential Contractor Program. Multifamily property participation was very low. In 2002, the utilities created a separate Multifamily Energy Efficiency Rebates Program so that this underserved sector could participate more fully in the portfolio of utility energy efficiency programs.

The MFRP is a statewide program operated by the four California investor-owned utilities (IOUs) using a uniform set of program guidelines and incentive levels. The MFRP provides rebates for a broad list of energy efficiency measures that can be installed in apartment dwelling units and in the common areas of apartment and condominium complexes. In this program, a multifamily complex has five or more units.

Table 2-1 lists the non-mechanical measures included in the program. Table 2-2 lists the mechanical measures.

Table 2-1: List of Non-Mechanical Measures and Rebate Amounts

Apartment Improvements	**Rebate Amount**
ENERGY STAR Labeled Ceiling Fans with CFL	$20
ENERGY STAR Labeled Screw-in CFL *	$2
ENERGY STAR Labeled Interior Hard-wired Fluorescent Fixture	$60
ENERGY STAR Labeled Exterior Hard-wired Fluorescent Porch Light	$30
ENERGY STAR Labeled Clothes Washers	$75
ENERGY STAR Labeled Dishwashers	$50
ENERGY STAR Labeled Programmable Thermostats	$20
High Performance Dual-Pane Windows	$0.50/ft^2
Attic or Wall Insulation	$0.15/ft^2
Low-flow Showerheads	$3.75
Faucet Aerators	$1.25
Common Area Improvements	
High Efficiency Exit Signs—retrofit	$4.50
High Efficiency Exit Signs—new	$13.5
ENERGY STAR Labeled Screw-in CFL*	5-13 W $5 14-20W $6.50 21-30W $7.25 R30 $10 R40 $12
Occupancy Sensors	$10
Photocells	$10
High Performance Dual-Pane Windows	$0.50/ft^2

* Towards the end of 2002, SCE and PG&E added an additional marketing spiff of $5.

Table 2-2: List of Mechanical and HVAC Measures and Rebate Amounts

		Rebate Amount
Central System Natural Gas Boilers		$1500
Central System Natural Gas Water Heaters		$550
Energy Efficiency Package Terminal Air Conditioners and Heat Pumps		$100
Natural Gas Water Heater and/or Boiler Controllers		$750
ENERGY STAR Labeled Programmable Thermostats		$20
ENERGY STAR Central Natural Gas Furnace 90% AFUE		$200
ENERGY STAR Central Natural Gas Furnace Variable Speed Drive 80% AFUE		$100
Natural Gas Storage Water Heater		$50
ENERGY STAR Labeled Room Air Conditioner		$50
Energy Efficient Central Air Conditioner	≥ 12 SEER	$100/unit
	≥13 SEER	$200/unit
	≥ 13 SEER w/ TXV	$325/unit
	≥ 14 SEER w/TXV	$425/unit
Energy Efficient Central Heat Pump	≥ 12 SEER, 7.6 HSPF	$175/unit
	≥13 SEER, 8.0 HSPF	$275/unit
	≥ 13 SEER w/ TXV, 8.0 HSPF	$400/unit
	≥ 14 SEER w/TXV, 8.5 HSPF	$500/unit

Unlike the earlier Residential Contractor Program, this program targeted property managers and owners directly. The individual utilities made numerous efforts to attract the attention of property managers/owners using such methods as direct mailing, cold calling of large customers, and teaming with local building owner/manager trade associations. Although these efforts had some success, contractor participation for electric measures in the first year was limited to a few large firms.

Interested parties, whether they were contractors or owner/managers, submitted program applications using the standardized forms. In 2002, these applications were processed on a first-come first-serve basis with no limitations imposed and no reservation system. A reservation system was implemented for 2003. In 2002, some measures, such as lighting, were fully subscribed quickly. Each utility acted individually in deciding whether to allocate funds earmarked for other applications to cover the excess lighting measure demand. Each utility processed, paid, and tracked its own applications. San Diego Gas & Electric conducted post-installation inspections on every one of its applications. The other utilities performed inspections on 5 % of their applications.

2.3 2002 Program Achievement

This section summarizes the participation data for PY2002. Section 7 provides detailed information on the savings.

Table 2.3 shows the number of applications submitted in PY2002. These numbers include projects where funds were committed before the end of PY2002, but final processing of the rebate took place in early 2003. It does not include projects where funds were committed in 2002 but later cancelled because the job either was not completed or was delayed past the final PY2002 report filing date, except where noted.

Table 2-3: PY2002 Number of Paid Applications

Rebates				
	Rebate Total	**Paid Rebates**	**Committed Rebates**	**Canceled Rebates**
SCG	$530,682	$461,695	$54,674	$14,313
SDGE	$1,122,927	$1,102,387	$18,500	$2,040
PGE	$1,062,567	$985,722	$76,845	N/A
SCE	$1,147,976 [1]	$852,708	$295,268	N/A
Jobs				
	Total Number of Applications	**Paid Applications**	**Committed Applications**	**Canceled Applications**
SCG	232	191	25	16
SDGE	140	135	4	1
PGE	224	165	59	0
SCE	307	173	134	N/A

[1] Does not include $ spiff payments to contractors for CFLs or torchiere returns.

Table 2.4 shows the breakdown of the jobs by end use. Table 2.5 shows the breakdown by utility. In PY2002, the contractor name was not required as part of the application. Some utilities recorded the name of the payee of the check, which in most cases was the contractor.

Table 2-4: Program Summary by End-Use

End Use	Quantity of Measures	Quantity of Applications	Rebates	Percentage of Rebates
SAN DIEGO GAS & ELECTRIC				
Not Listed	51	10	$12,750	1%
Appliance	2	1	$100	0%
HVAC	142	20	$106,500	10%
Indoor Lighting	16534	116	$990,087	88%
Outdoor Lighting	80	1	$2,400	0%
Light Controller	5	1	$50	0%
Water	6	3	$9000	1%
SOUTHERN CALIFORNIA GAS				
Appliance	42	25	$2,125	0%
HVAC	32	8	$21,460	4%
Water	747	187	$487,095	94%
Insulation	37929	14	$5,689.35	1%
PACIFIC GAS & ELECTRIC				
Appliance	106	25	$6,100	1%
HVAC	156	37	$42,790	4%
Indoor Lighting	48730	101	$881,973.5	83%
Outdoor Lighting	2960	44	$84,590	8%
Light Controller	99	8	$990	0%
Water	75	15	$6,091.25	1%
Insulation	167008	14	$24,637.35	2%
Window	30789	21	$15,394.5	1%
SOUTHERN CALIFORNIA EDISON				
HVAC	335	14	$18,000	2%
Indoor Lighting	121710	275	$876,930.50	76%
Outdoor Lighting	18186	186	$252,996	22%
Light Controller	5	2	$50	0%

Table 2-5: Program Summary by Contractor

Contractor Name	Rebates	Percentage Of Rebates	Number Of Applications
San Diego Gas & Electric			
No Contractor Listed	$100.00	0%	1
Contractor A	$723,180.00	66%	75
Contractor B	$202,860.00	18%	28
Contractor C	$617.00	0%	2
Contractor D	$31,000.00	3%	5
Contractor F	$34,860.00	3%	10
Contractor G	$97,250.00	9%	28
Contractor H	$31,020.00	3%	3
Pacific Gas & Electric			
No Contractor Listed	$242,133.8	23%	121
Contractor A	$2,070	0%	1
Contractor B	$189	0%	1
Contractor C	$1,000	0%	2
Contractor D	$83	0%	1
Contractor F (*Contractor A in SDG&E*)	$78,840	7%	3
Contractor G (*Contractor B in SDG&E*)	$342,360	32%	12
Contractor H	$697.5	0%	1
Contractor I	$100	0%	1
Contractor J	$600	0%	1
Contractor K	$386.5	0%	2
Contractor L	$903	0%	1
Contractor M	$6,032.5	1%	1
Contractor N	$440	0%	1
Contractor O	$450	0%	1
Contractor P	$600	0%	1
Contractor Q	$96	0%	1
Contractor R	$72	0%	1
Contractor S	$100	0%	1
Contractor T	$700	0%	1
Contractor U	$316.8	0%	1
Contractor V	$2,855.2	0%	2
Contractor W	$108	0%	1
Contractor X (*Contractor F in SDG&E*)	$371,670	35%	57
Contractor Y	$1,805.7	0%	1
Contractor Z	$370	0%	1
Contractor AA	$550	0%	1
Contractor AB	$3,807.9	0%	2
Contractor AC	$892.5	0%	1
Contractor AD	$2,287.25	0%	1
Contractor AE	$50	0%	1

* Data Not Available for SCE or SCG

2.4 Program Changes for 2003

Reflecting experiences during the initial PY2002 program year, several changes were made for PY2003.

- **Implementation of a 45-day reservation system**. This new system was implemented to prevent contractors from locking up a disproportionate amount of program funding that might not result in actual measure installations. With the new reservation system, contractors have 45 days to file a completed rebate application seeking their reserved funds. If the amount is not claimed, it rolls back into the general fund of monies available.

- **CFL incentives increased**. CFL incentives were increased from $2 to between $5 and $7.25, depending upon the type of lamp.

- **Programmable thermostat incentives increased**. Incentives were increased from $20 to $50 for thermostats.

- **Controller incentives modified**. A tiered rebate was implemented for controllers, resulting in three options. The first option, targeted at buildings with 20 units or less, includes a basic controller and has a $750 incentive. The second option, targeted at buildings with more than 20 units, provides a $750 incentive for a non-digital display, graphing model. The third option, also targeted at buildings with more than 20 units, provides a $1,500 incentive for a controller that includes a digital display, graphing model.

- **Gas water heater incentives reduced.** Incentives were reduced from $50 to $40 for 30-40 gallon-size tanks (note that central water heater incentives start with tanks 75 gallons and larger).

- **Window incentives increased**. Incentives for windows were increased from $0.50 to $1.00 per square foot.

- **Additional Measures**. The following were added to the list of qualifying measures:

    - Reflector CFLs (interior and exterior, R-20, R-30)
    - ENERGY STAR electric water heaters
    - Coin-operated washing machines

- **Reservation Limits**. The CPUC established limits on the amounts that could be reserved at any one time. Specifically, a single entity could not reserve more than 5% of available funding. In part as a response to this limit, several new companies formed to provide services under the program, with some sharing physical addresses and personnel with other participating contractors.

- **Gas furnace efficiency requirements**. Beginning in 2003, furnaces must have a rating of at least 90% AFUE to qualify for a financial incentive under the program.

- **Electric water heaters added**. In 2003, electric water heaters were added as a qualifying measure.

- **ENERGY STAR coin-operated washers added**. Financial incentives were added to complement rebates already provided through a third-party local program.

2.5 PY2003 Status

The MFRP opened in mid-April of 2003 and, as of mid-July, was essentially fully subscribed for electric measures; though PG&E ran their program through October 2003, and SCE did not officially close the program until mid-November. While not all of these funds would necessarily be spent, the speed with which they were committed indicates the level of demand for services promoted under the program. As a result, each utility sought to supplement the 2003 program with additional monies. SCE, for example, had only 6% of its funds available at mid-year and requested additional funding of about $575,000, though they ultimately received $100,000 in additional funds.

Program managers indicated that PY2003 had witnessed an influx of new companies seeking to provide services to multifamily customers. While program managers noted that some of these new entities might have been formed because of the per-company reservation caps imposed in PY2003, program managers also attributed the influx, in part, to a bad economy that brought in new players looking for ways to make money. For example, some contractors who had previously participated in the Statewide Express Efficiency program have started to provide services in the multifamily sector.

Overall coordination among the utilities was very good, with representatives from each utility team communicating weekly via conference calls to review progress toward goals and to discuss any issues that needed to be addressed related to funding, quality control, etc.

Increased incentives for CFLs, as well as the introduction of R-30 and R-40 reflector-CFLs, have resulted in increased installation rates for these lighting measures.

The reservation system reportedly was working very well and had extended the life of the program. Without the reservation system, in 2002, for example, the PG&E program was closed out within two to three weeks. In 2003, monies were still available three months into the program. Each utility applied the reservation system a bit differently, with reservation limits being most strictly applied to electric-related measures such as CFLs, interior and exterior hard-wired fixtures, and thermostats. Utilities have tried to retain some flexibility within the system to ensure that the overall mix of installed measures is in line with initial program projections.

While gas measures were doing better than in 2002, this continued to be an area of weaker performance for the program. In July, PG&E reportedly was still at about 25% on its gas goal and contemplating additional marketing in this area. SCG and SDG&E also experienced activity

levels below what was needed to reach their year-end goals. In the second half of 2003, the utilities did additional marketing such as advertising and direct mailing that helped them meet their goals.

2.6 Planned Changes for 2004

Some minor modifications are contemplated for 2004, mostly centering on incentive levels and qualifying measures.

- **Adding T5 and T8 lamps**. Program managers are considering adding T-5 and T-8 interior garage lamps for high-rise buildings.

- **Lowering the basic rebate for hard-wired fixtures**. The basic rebate level may be lowered slightly and installing lamps in closets and storage areas would no longer be permitted. There is some concern among the program managers that if incentives are lowered, some contractors will not participate in the numbers that they have thus far.

- **Increasing the rebate for exit signs.**

- **Increasing incentives for attic insulation, wall insulation, and low flow showerheads**. The insulation market is composed of a small number of firms with an even smaller subset working in the multifamily market. To stimulate interest in these measures, program managers looked at proposing incentives of $\$0.30/ft^2$ for 2004 (up from $\$0.15/ft^2$ in 2003) for insulation.

- **Limiting total CFLs per dwelling unit based on the number of bedrooms in unit**.

2.7 Report Organization

The remainder of this report is divided into seven sections. Section 3 discusses the process evaluation issues. Section 4 reports on contractor-related research. Section 5 discusses the owner and property manager interviews and surveys. Section 6 reports on the results of the on-site inspections. Section 7 discusses the savings assessment. Section 8 examines hard-to-reach issues. Section 9 provides a summary and recommendations for the program and future evaluations.

3. PROCESS EVALUATION ISSUES: STAFF FEEDBACK

In-depth interviews were conducted with program managers at each utility. These interviews, conducted in June 2003, were intended to inform the evaluation scope and to highlight any pertinent process-related issues. Given the timing of these interviews and the fact that several changes had been made based on PY2002 experience, the discussions were focused on both PY2002 and PY2003.

Overall program delivery is quite smooth. The reservation system, implemented in PY2003 in response to PY2002 experiences, contributed to a smoother running program in 2003 as compared with 2002.

Program managers were asked for feedback on the following topics:

- Qualifying measures and rebate levels,
- Quality control,
- Program marketing,
- Hard-to-reach customers, and
- Long-term strategic issues.

3.1 Qualifying Measures and Rebate Levels

Electric lighting measures have moved very well and, in large part, dominate the statewide program. Overall, gas efficiency measures have been slower than desired. Insulation measures, which result in both gas and electric savings, have not moved as well as desired, due in part to the relatively small number of contractors working in the retrofit insulation market. An exception to the record of slow sales is thermostats, which result in electric and gas savings. These measures have become increasingly popular, with a few contractors promoting this measure very actively. As a result, the program will likely install more thermostats than initially planned in 2003.

Program managers raised several issues related to other measures promoted under the program.

> There is a concern that some contractors may be installing fixture types for which replacement bulbs cannot be found. Non-screw-in lamps, for example, are not readily available in neighborhood hardware or grocery stores where consumers typically purchase light bulbs.
>
> There was some discussion regarding the development of very specific product lists to replace the existing specifications. While there are potential benefits to such lists, there is a conflicting impression among program managers that an approved product list would lead to micromanaging, something the utilities have endeavored to avoid.

Access to tenant units continues to be a challenge in that it effectively imposes a transaction cost on the property owners. This transaction cost, coupled with the fact that tenant units are typically individually metered, requires that the tenant measures be provided at no cost in order to gain property owner participation in coordinating access to these tenant units.

3.2 Quality Control

Quality control steps vary by utility, with SDG&E and SCG having the most aggressive quality control features at this time. Program managers report that participating contractors are performing well overall. Most issues identified through inspections relate to accounting and paperwork procedures. As a result, applications submitted by new contractors are closely scrutinized until a record of accomplishment has been established.

SDG&E and SCG had 100% inspection in 2003. SCG increased their inspection levels from 20-30% to 100% in 2003. PG&E and SCE inspected about 5% of their jobs. In most cases, the inspections are compliance-related (with some safety-related inspection points) in that they confirm the quantity and presence of equipment installed as claimed by the application. It was noted, for example, that although thermostats were checked to ensure installation, programming of those thermostats was not checked.

In these inspections, some instances where more measures were claimed than were found in the inspections. Specifically, inspections conducted four to eight weeks after installation indicate that CFLs may not be in place. Program managers report that in some of these instances they found that the lamps had been moved around, as well as cases in which the installers had not counted correctly.

Program managers raised two issues that highlighted concerns related not to the quality of work or accounting, but rather to the quality of the *measures* being installed. These measures included plastic exterior fixtures, reflector CFLs, some interior fixtures, plastic showerheads, and poor quality CFLs. On-site verifications and the property manager survey also revealed issues regarding the quality of some of the products. The issue of quality control will be discussed further in this section and in Chapter 9.

3.3 Marketing

At present, contractors are actively marketing the program. As the program manager at SDG&E noted, for example, contractors are highly motivated and play a valuable role in helping SDG&E meet its goals in terms of specific measures required. While some contractors view the program as a short-term opportunity, those who view it as a long-term relationship are more sophisticated and are typically very responsive to working with the utility.

Although the utilities note that contractors will always play a prominent role in marketing the program, the utilities would like property managers/landlords to be more active in initiating the rebate process and selecting of a contractor. There has been some progress in this area, and the

utilities report that the program is beginning to move in the direction they want it to go, with property managers inquiring about the program. One property management company, for example, has hired its own contractor (one that was not otherwise involved with the program). Another company headquartered in Colorado called recently to discuss hiring its own contractor. Program managers report that they would like to see more of this activity in the future.

Although program marketing to property managers has thus far been limited, program managers report that one long-term measure of success will be an increased level of awareness regarding program availability among property managers. In 2002 and 2003, work developing and implementing the reservation system was time-intensive for the program managers. The marketing to property managers included the following.

- **Trade shows to promote the program**. There has been some cooperation among utilities in attending trade shows. SCG and SCE, for example, attended one trade show jointly in 2003. SCE exhibited at three trade shows in 2002.
- **Post cards to property managers.**
- **Flyers in apartment association trade journals**. Flyers have been included in apartment association trade journals, such as the Apartment Association Greater Inland Empire (AAGIE), Apartment Association of Southern California Cities, and the Apartment Association of Orange County.
- **Trade magazine ads**. Utilities also ran ads through apartment owner magazines and received numerous inquiries as a result.
- **Homeowners' associations**. Homeowners' associations are targeted for common area improvements.
- **Property managers**. With the price of gas increasing, PG&E sent letters to its internal list of property managers (1,600 names), including past program participants, urging them to take advantage of the program as a way of controlling their energy costs.

It was noted that long-term marketing to property managers should include education regarding energy efficient lamps and fixtures so that they can make informed decisions regarding the selection of these measures. This will help ensure that contractors offer high quality measures that are likely to remain in service.

One challenge posed in marketing the program is the limited availability of incentive funds. Ideally, program managers want a steady stream of funds available and to be in a position where they can market the availability of such funding on an on-going basis. Program managers see a potential opportunity for coordinating marketing with the low-income programs since the target markets overlap to some degree.

A unique factor driving the market for boiler replacements and controllers is Rule 1146 passed by the South Coast Air Quality Management District (SCAQMD). Rule 1146 requires that older boilers, which have greater emissions, be replaced with newer energy efficient boilers. In 2003, SCG is targeting 90 controllers and 25-30 central water heaters. The timeframe for this expires in 2006 when the newer models become mandatory.

3.4 Hard to Reach Customers

An underlying program goal is to serve hard-to-reach customers. Under CPUC guidelines, multifamily customers are by definition classified as "hard-to-reach." In addition, utilities have sought to market the program proactively to select segments in order to improve reach into the under-served market segments. Some of this marketing has been directed to rural areas outside the urban population centers. PG&E, for example, focused program marketing on areas outside the nine-county region in the Bay Area. SCE provides contractors with a list of specific zip codes where a high proportion of moderate income households reside. Additionally, rural areas as identified by Statewide Residential Needs Assessment study are also targeted by SCE's program. SDG&E, which has a large number of higher income customers living in multifamily units, used Census Tract-level data to direct contractors toward areas with moderate-income customers. Each utility has also set HTR goals and tracks progress in serving these customers; in each instance, utilities report they have achieved and surpassed these goals.

3.5 Long-Term Strategic Issues

Program managers raised several questions and/or issues regarding the long-term strategy for the program.

- What steps can be undertaken to better increase the awareness of the property owners? What is the best way to reach these market actors?
- How big is the potential for the multifamily market? When will the program reach saturation potential?
- How much do contractors pay for the various items, and how do rebates compare to these prices?
- How can the participating contractor market be diversified?
- How can the utilities increase penetration of gas efficiency measures?

These research questions were explored in detail throughout the course of this evaluation, and recommendations are provided in the final chapter of this report.

4. CONTRACTOR FEEDBACK

4.1 Background

Although MFRP is conceived of as a landlord/property manager-focused program, contractors initiated the vast majority of applications submitted. For this reason, the evaluation interviewed a sample of the participant contractors. Telephone interviews were conducted with participating contractors during June and July 2003. Participation was based on the program records for PY2002. If an application had been processed with the contractor's firm listed, this contractor was included in the participant sample. As a result, the evaluation team spoke with some contractors who were unaware of their role in the program because they had done the work on customer-sponsored applications. However, this was not typically the case. Most respondents were well aware of their participation and were quite familiar with program details.

This research covered a range of topics:

- Overall view of the program and key factors shaping contractor opinions,
- Plans regarding continued or future participation,
- Perceptions of program's strengths and weaknesses,
- Perceived need for additional program marketing and recommendations in this area,
- Reaction to the application process, including paperwork and processing time,
- Reaction to current incentive levels and possible changes in incentive levels,
- Estimated change in participation levels should it become possible to keep the program open for a longer period,
- Suggestions for additional measures to include in the program, and
- Additional recommendations for program modification.

Respondents were also profiled in terms of the following:

- Types of jobs performed for the program, and
- Business characteristics.

The discussion's focus was to be the 2002 program. However, due to the timing of the research, the respondents typically digressed into discussions of the 2003 program. In particular, the reservation system, incentive level changes, and the timing of program rollout in 2003 were of interest to the participants interviewed.

To augment the findings from the participant research, additional in-depth interviews were conducted with nonparticipating plumbing contractors and plumbing supply companies. These interviews were designed to assess program awareness among non-participants who install gas-fired equipment and to explore issues related to participation among these trades. The focus on the gas market was intended to provide useful information on reasons for the lower level of program activity on the gas side. Interviews were completed with representatives from 16 plumbing contractors and eight plumbing supply companies. All contractors were screened to ensure that they worked actively with multifamily building owners and managers.

4.2 Findings from Participant Contractor Research

4.2.1 Characteristics of Respondents

The findings summarized here are based on feedback collected through 17 interviews representing 22 firms. Of these, four firms installed windows and insulation, five installed lighting measures exclusively, two installed lighting and programmable thermostats, three installed water heater controllers but no other program measures, three installed boilers (one of these also installed water heater controllers), and one firm installed air conditioning equipment. Two firms installed a mix of measures.

Most firms had one or two offices (39% of respondents had one office and 39% of respondents had two offices). The average number of employees was 33, but two firms with 100 or more employees skewed this information; 53% of the respondent firms had 20 or fewer employees.

Respondents' estimates of the number of multifamily buildings they work in annually are 444 per business, on average. Respondents' best estimates indicate that a typical average number of dwelling units is 130 per building served. These estimates suggest that, overall; the firms represented in this research population perform work in approximately 8,877 buildings encompassing 1,154,400 dwelling units annually.

4.2.2 Contractor Awareness and Interest in Program

Not surprisingly, awareness of the MFRP is strong among participants and most felt the utilities were doing a fine job in notifying contractors about the availability of the program. An illustrative comment from one respondent was, "the communication is very good. We keep in close contact."

The majority of the most active contractors mentioned self-initiated contact with the utilities or their websites to keep abreast of program status. It is clear that several firms pay close attention to the program's operations, schedule, and year-to-year changes, reflecting a high level of interest in the MFRP. Quite a few respondents indicated the utilities did not need to focus attention on contractor notification about program availability, as this was not a problematic area in their view.

Nonetheless, there were indications that there may be a need for more outreach to uninvolved contractors to keep them apprised of program changes from years past. The weakest market segment with respect to program awareness (and interest) seemed to be among certain plumbers who see little marketing benefit to them in using the program to sell jobs. This segment, along with contractors who have dropped out because of a frustrating prior experience, seems to harbor outdated views about certain program elements such as incentive levels and procedural arrangements. The utilities may wish to consider some targeted outreach for the 2004 program to attract under-active segments. Active participants do not have significant needs in this area.

4.2.3 Multifamily Sector Awareness of the Program

Some contractors report that their clients are aware of the program, and that some were well aware of the program to the point of timing their retrofit installations in relation to incentive money availability. This pattern is evident almost exclusively among large property owners and/or managers. Among smaller facility owners, there is not much program awareness and contractors serving smaller properties or smaller firms are more likely to suggest that additional advertising to their clients would be helpful. It was also suggested that the type of outreach to small multifamily property owners needed to be qualitatively different from that used for large property managers.

While multifamily property owners or managers may be aware of the program's availability, they may not be conversant with the program's requirements. In particular, the application documentation requirements were not being fully understood or appreciated by property owners. Outreach to property owners and managers must communicate the program requirements effectively in order to minimize application errors or omissions and, subsequently, customer dissatisfaction that could arise from a delayed payment.

4.2.4 Overall Satisfaction with Program

Respondents were asked to rate their experiences with the MFRP on a 10-point scale, where one represented "not at all satisfied" and 10 represented "very satisfied." For the group, the average satisfaction rating was 6.4.

Comments included the following:

- "The program helps a lot. It's great for business."
- "The program's greatest strength is it helps the tenants."

Firms installing boilers were among the most satisfied with the program overall, giving an overall score of 8 or 9 in all cases. All these contractors planned continued participation in the program. Ratings from the windows and insulation contractors averaged a 6 (ranging from 3 to 10); half of these firms did not have plans to participate in the future. Among lighting contractors, ratings ranged from 2 to 10 with an average satisfaction rating of 5.6. Despite the lower stated scores, firms in this group all planned to continue with the program. Two respondents from firms that install lighting measures made a point to indicate that their satisfaction levels had declined from 2002 to 2003, with the reason for this decline being the reservation system and the limitations this placed on incentives for projects in large facilities. Installers of water heater controls seemed least engaged with the MFRP; two out of three felt it was not of much use to them.

Some indication of factors driving overall satisfaction levels can be ascertained from satisfaction ratings given to specific program elements such as incentive levels, payment processing time, and application process. As shown in Table 4-1, satisfaction was lowest with the application process and the time for processing payments.

Table 4-1: Comparison of Program Feature Satisfaction Levels

Program Element	Average Satisfaction Score
Incentive levels	6.0
Application Process	4.0
Application Form	6.1
Payment Time	4.9
Overall	6.4

Areas of concern varied to some degree among the specialties. For example, boiler installers were far more concerned over payment processing time than program paperwork. Conversely, payment processing time was not an issue for most of the insulation contractors, who had received full payments from their customers and left the reimbursement issues to the customers. As a group, lighting contractors and window installers had more concerns over paperwork.

4.2.5 Program Funding

Funding availability is a key issue. Still, the participants appear to have accepted that program funding tends to run out. As one respondent put it, "We try to make do with what they have."

It is clear that if funding were increased, the program could run longer and accommodate more jobs, thereby increasing market penetration. This appeared to be strongest among firms installing boilers and lighting. Among window and insulation contractors, half would increase participation under current program design. The other half have already dropped out of the program for 2003 or were unaware that their customers had elected to use the program.

4.2.6 Incentives

There is a very strong consensus that it is preferable for incentives to be kept at the current levels rather than to extend program operations by lowering unitary incentives. One lighting installer put it this way, "If they lower the incentives, nobody will do it, then they won't run out of money." Another indicated, "We are pleased with the rebate amounts because with these rebates we can offer the products to our clients at no cost. … The program gives us the ability to reach a lot of complexes that we otherwise could not."

The insulation industry echoed these sentiments. "The incentive is what is getting them [the customer] to do it now. If it is lowered, you could lose that." Additionally, from the boiler industry, "We almost have to have the rebate in order to sell the higher efficiency equipment" and "People will switch to efficient equipment more readily for a rebate even if they have to wait until the next year."

These comments, along with other information collected during the interviews, suggest that the incentives do influence the market and they significantly drive the business of some participating companies. Incentives allow contractors to convince clients to go forward with installations that otherwise may not happen. Moreover, there was some feeling that incentives have improved this year. Still, reaction to the incentives varied, with the comments in Table 4-2 illustrating some of the differences found by measure type.

Table 4-2: Reaction of Participating Contractors to Incentive Levels Offered Through the Multifamily Rebate Program

Measure	Opinions Expressed on Incentives
Lighting	▪ "I'm pleased with the rebate amounts [in 2003]. We can offer it to our clients at no cost. There are some apartment owners who wouldn't pay $1 for things." ▪ "Last year the incentives on CFLs were completely useless."
Windows	▪ Multiple respondents indicated that 50 cents per square foot on windows is too low. ▪ "$1 per square foot is very effective." ▪ "It should be $2 per square foot."
Air conditioning	▪ "Very effective" incentives for air conditioning.
Programmable thermostats	▪ "We would like to do programmable thermostats but the levels are too low." ▪ "The incentives for programmable thermostats are not as good as those for lighting."
Water heaters	▪ "Too low." ▪ " It's too much paperwork for the amount of money paid per water heater."
Water heater controls	▪ "Could be higher." ▪ "As they are today [2003], the levels are good." ▪ "We don't get anything out of the program. The money should be paid to the contractor."
Boilers	▪ "The incentives are very instrumental" in convincing people to switch to efficient equipment. "We almost have to have the rebate in order to sell [high efficiency boilers]." Still, "it is not an equal playing field for boilers. The incentives for boilers should be increased to reflect the greater energy benefits. Boilers are worth twice as much as controllers but they get the same amount." ▪ "The change-outs would happen faster if the rebates were higher." ▪ "The price is right." ▪ "This program needs more money for customers. The commercial program has more money for the same equipment. In this program the rebates are not a big push [for sales of high efficiency boilers]."

Some participants felt that gas measures were not receiving a just level of funding under the program and that on a comparative basis, the gas measures receive relatively little in relation to the magnitude and durability of the savings provided. It also appears that the incentives are simply not large enough to attract the same strong interest levels as on the electric side. One installer of gas water heaters said, "We don't promote the program. It's not worth it for us." A respondent from one firm that installs a variety of measures indicated, "The program is weak on the gas measures. We could do a lot more there – it's a simple program."

Opinions were split among lighting contractors on whether they would continue participating in the program if the incentives for hard-wired fluorescents were lowered. One respondent explained it thus, "That's the best measure they have now, because they didn't have it before.

We can find lots of facilities where hard-wired fixtures can go in." Another respondent suggested that the utilities look at refocusing where the incentive money is spent, implementing selective reductions, and offsetting these with increases on other measures. A third suggested that some reductions be made, but that the incentives for fixtures remain the same. Others indicated that if the incentives for hard-wired fixtures were lowered, they would stop installing them and may not continue participating in the program.

4.2.7 Reservation System

Most contractors like the reservation system as it increases their certainty of being paid. There were cases in past years where the utilities ran out of funds much faster than several of the contractors anticipated. There is a persistent residuum of ill will regarding past work done in expectation of receiving incentives only to be stuck with an unpaid bill. The reservation system is seen as a useful means of addressing that problem.

More than one respondent wanted to see the reservation system expanded to apply to all types of measures, desiring, for example, to see the same type of guarantee when installing water heater controls as exists for lighting applications. There is concern that without a reservation system, the funds for some measures could be depleted. "If we're not collecting from the customer and the utilities run out, our firm loses money."

One drawback to the reservation system is that it creates an awkward application process for large projects. Two respondents mentioned this as a key shortcoming of current procedures. One indicated that it was a matter of having to make customers sign off on four or five applications for a single project. Another indicated that the process required breaking large projects into separate pieces of work conducted at different times. This type of cumbersome arrangement led to the loss of work.

4.2.8 Application Process

Most but not all respondents felt the utilities had done a reasonable job with the application and the required paperwork. Some had noted improvements for this year. One respondent mentioned the paperwork simplification as the key strength for the 2003 program. Not all shared this opinion, as is discussed shortly. Where issues on the paperwork remain, it is an important barrier to re-enrollment for some program dropouts.

Satisfaction with the program paperwork seemed to be linked to the type of measures installed, with complaints being more frequent among the lighting and windows installers. Paperwork was not a concern among any of the interviewed participants who installed boilers or insulation.

Opinions varied regarding having the customers do the program paperwork. For example, one air conditioning contractor and one firm that installs water heater controls indicated that applications were too technical for clients to be able to fill them out on their own. Another firm reported that the lighting applications were too time-consuming, so they gave the paperwork to their clients. Most insulation contractors interviewed indicated that they have their customers handle the program applications. Among firms that still completed the paperwork themselves, the rationale was typified by the following comments:

- "End users don't want paperwork, especially property managers. The decision to do the rebate as a customer rebate [process] – that doesn't work for our customer base."
- "We still do the paperwork ourselves."

For next year, it is strongly recommended that all the utilities make electronic data entry possible, and that participating contractors are made aware of this option. Creating an on-line or computerized data entry option was one of the most frequent suggestions offered by the participants. The Excel-based form offered by PG&E was characterized as "extremely helpful." A PDF format was also requested.

Although most respondents were content with the paperwork, some firms found the paperwork burdensome. This was the principal cause of their having stopped marketing the program. Fundamental problems include the fact that separate, duplicative paperwork was required to document installations in individual dwelling units, along with inflexibility in payment processing procedures, payment delays, and difficulty in reaching a utility representative who could address questions about applications. Obviously, when a job entails installations in 200 or so dwelling units, having to complete separate paperwork on each dwelling unit would be a burden. When the participant finds that they will not receive any reimbursement until every form for the entire job is complete without error (including minor oversights such as a missing date for one unit out of the total), then a major barrier to repeat participation has been created. It is unclear if these firms are aware that Excel forms are available now; it appears they have stopped following the program altogether.

4.2.9 Payment Processing

A few respondents noted problems with payment times. Some respondents felt that this may be linked to frequent turnover in program managers or to past program changes. One respondent noted that over a period of 27 months, there had been six program managers at one utility. Another respondent also reported that the bonus incentives offered in PY2002 led to longer payment processing times and made the whole application and payment process significantly more complicated.

One complaint focused on a more recent request from the processing utility for original signatures of the contractors' clients. It was felt that faxed signatures should suffice, and that it should be recognized that using faxed signatures is commonplace and an accepted practice in their industry. PG&E, for one, does accept faxed signatures. Requiring original signatures will delay applications by as much as two weeks, which is not attractive to participating contractors.

One important point to note is that payment time is likely to be affected if the percentage of jobs verified increases. The utilities might want to consider imposing a deadline on themselves, where payment is sent after four weeks even if verification has not been completed.

4.2.10 Experiences across the Utilities

Those respondents who had worked on jobs in more than one service area were asked if, in their experience, the program varied significantly between utilities. The differences were primarily in payment processing times and procedural requirements before an application would be approved. Also mentioned were differences in communications support, in rebate availability and, in some

cases, amounts. From this discussion, it became clear that the contractors prefer working with utilities that:

- Process payments quickly,
- Keep contractors informed of funding availability status,
- Show flexibility in moving paperwork through the approval process,
- Have the answers to questions, and
- Call back.

4.2.11 Program Influence

The rebate program and the availability of funding at any point in time influence the business operations and marketing activities of participating contractors. This influence manifests itself in decisions about what type of work to do, when to do it, and where to promote their services.

Participants direct their marketing to periods and geographic areas in which funding is available. If funding for a target measure is exhausted in one utility area, "this forces our marketing to go to [another]." Decisions on what measures to include are also driven by the levels of the incentives offered and the perception of the attractiveness of this compensation level.

There are pronounced marketing pushes timed for the start of program availability as well. Some firms indicated that their business slowed in spring 2003 when program rollout was delayed. Others indicated that they—and their clients—compress their activity into the period of incentive availability.

The program's stop-and-start operation creates some upset in the market by causing decisions on equipment change-outs to be postponed until program funding availability resumes. As one respondent put it, "Our clients, large property managers, are very sophisticated. They will wait until utility funds are available." "The program is a blessing and a curse. Transactions that were not economically feasible in the past now are. But it absolutely slowed our business in the first quarter [of 2003] when the program was delayed."

In the most noteworthy case uncovered, the program's influence went far beyond job scheduling. In this case, the presence of the MFRP drove business formation itself. In one interview, it was disclosed that a series of sister companies was formed to maximize incentive money and avoid the limits that otherwise would be imposed by the reservation caps. These companies operate from the same address and offer the same services as one another, with some possible differences in the geographic areas targeted.

Other businesses reported that their firms diversified or expanded their operations because of the program. More than one respondent indicated that they are pursuing work in the multifamily sector because of the program. It seems clear from this feedback that the program helps many businesses sell jobs in the multifamily sector, that the amount of work promoting higher efficiency equipment in this sector has increased, and that the rebates are instrumental in this effect. The least effect on business operations was evident in the insulation and window segments. Here, half of the firms interviewed indicated that the program had no effect on their

business. However, these firms were also likely to indicate that higher incentive levels would spur more market activity.

4.2.12 Measures to Consider Making Eligible

Participants were asked if there were energy efficient technologies available in the market that they would like to see made eligible for incentives in the MFRP. Additional measures mentioned as being worth consideration included the following:

- Add boilers at the 400,000 BTU level,
- "Add-on products" such as heat exchangers for boilers,
- Solar for pools and spas,
- Set point controls for pools and spas,
- Motor controls for magnetic elevators,
- High efficiency motors for exterior applications (waterscaping),
- Exterior pole lights, and
- CFLs as replacements for HID lighting.

4.2.13 Recommendations from Contractors

Participants were asked to suggest improvements for the MFRP. The preceding pages have already discussed much of the direction given by respondents. A few highlights are mentioned here.

One of the most widespread recommendations is to increase the amount of funding available so that the program can remain open for longer periods, more jobs can be completed, and the risk of losing money or having to curtail project activity is reduced. While the reservation system is viewed favorably, contractors would have an even greater sense of security if program funding were available for longer periods each year. As discussed earlier though, they would not want a longer open period to come at the expense of the incentives levels offered.

Some participants desire simplified program paperwork. This will make the program less burdensome to participating contractors as well as make it realistic to ask the participating property managers to complete the applications. Electronic data entry was mentioned frequently as a positive step that could be taken to improve the paperwork process.

Some also mentioned more flexibility on paperwork processing and better communications with participating contractors regarding pending applications. Being unable to have questions answered about application status or proper procedures creates substantial frustration. Although this is not a universal problem, where it occurs it is a significant problem for participants. Better access to a knowledgeable representative who can answer and resolve issues would ameliorate this shortcoming.

4.3 Feedback from Nonparticipating Plumbing Contractors and Distributors

In this task, representatives from 16 non-participant plumbing contractor firms were interviewed to elicit feedback on a variety of gas-related measures, including furnaces, water heaters, boilers, and water heater controllers. The team focused on these measures in order to provide recommendations for the program managers in the area of gas measures. Topics covered included (1) awareness of the program, (2) perceptions regarding rebate levels, (3) property manager decision-making related to gas efficiency measures, (4) and potential marketing strategies.

4.3.1 Respondent Characteristics

The plumbing contractors interviewed in this task reported dealing with a variety of gas-related measures, including furnaces, water heaters, boilers, and water heater controllers. Table 4-3 presents the distribution of the types of equipment installed.

Table 4-3: Types of Equipment Installed

Type of Equipment	Number of plumbing contractors installing this type of equipment
Gas Furnaces for Individual Units	16
Gas Water Haters for Individual Units	16
Central System Gas Boiler	6
Central System Gas Boiler and Water Heater	7
Central System Gas Water Heater	13
Gas Boiler/Water Controllers	4

There appears to be a fair level of contact between equipment distributors and property managers at some level, although sales are more typically handled by contractors. Five of the eight distributors interviewed said that they deal directly with multifamily owners or property managers, but noted that sales are most often through contractors.

Interestingly, two respondents were in the process of reducing their presence in the multifamily marketplace due to the higher costs involved with absentee owners. This feature of the multifamily market results in longer payment periods, requiring more paperwork, increased costs of liability insurance, and greater difficulties reaching their contacts because they do not live on the premises.

4.3.2 Market Dynamics

High efficiency equipment is reported to be readily available. All of the respondents said that they offer or stock high efficiency options for space or water heating. They also report that equipment is readily available when needed.

Half of the distributors interviewed report promoting energy efficient equipment. Four of the eight distributors believed that they at least actively promoted high efficiency equipment on occasion. One respondent said that all he sells are 90% AFUE units. The other three respondents said they occasionally run promotional flyers or banners to advertise rebates or other information related to high efficiency equipment. The other four respondents said they have the equipment available.

Contractors confirm that building owners typically only replace equipment in an emergency (i.e., when it completely breaks down or is leaking) and do not consider energy efficiency a priority.

By far, building owners view first cost as the primary consideration in facility upgrade or equipment replacement decisions. In fact, most respondents said that energy efficiency is not really a consideration (the exception was one respondent who thinks that 65% of building owners consider energy efficiency). More typical is the view that building owners might be interested in energy efficiency if it saves them money. Representative quotes on this issue include the following:

- "Owners object to high efficiency on price…what is the payback that they will receive for investing in energy efficiency."
- "Getting it done quick and at a reasonable price is their concern…they don't mention energy efficiency when replacing equipment."
- "Building owners only talk about energy efficiency if I bring it up."
- "Cost is the most critical consideration…owners are not concerned with energy efficiency for tenants."
- "We make emergency sales to building owners…they are not proactive…99% of the time they are replacing a system when it is leaking."
- "Owners and property managers talk about it, but the high cost of high efficiency equipment compared to the savings available in warm climates steer them away."

4.3.3 Program Awareness

In general, plumbers and contractors have experience with energy efficiency programs. Both plumbers and distributors were asked about their familiarity with existing energy efficiency programs. Ten of the plumbing contractors and six of the plumbing suppliers were aware that programs existed. None of the respondents knew the names of programs, but knew that rebates were available for customers. Most commonly, they mentioned the following equipment:

- Air conditioning,
- Water heating,
- Gas furnaces,
- Low flow toilets and showerheads, and
- Setback thermostats.

Awareness of multifamily programs specifically is very low among both contractors and distributors. Respondents were asked if they had heard of the California MFRP. Significantly, none of the respondents expressed awareness of a separate program for multifamily energy efficiency. Awareness was limited to programs involving single-family homes. Possibly, they were not aware of a separate program for multifamily.

4.3.4 Perspectives on Rebate Levels by Contractors

Most of the plumbing contractors (12 of 16) thought the rebate level for gas water heaters (individual units) was too low. The consensus is that the rebate level should be closer to $100. Only two respondents from plumbing supply companies thought the incentives were too low.

Rebate levels for gas furnaces are also reported to be low. Five respondents thought the gas furnace rebate should be closer to $500. Two of these respondents actually calculated the incremental cost difference between high efficiency and standard efficiency and said that it was approximately $1,000-$2,000 (depending on specific equipment, how much accessory equipment must be changed out, etc.).

Generally, the other incentive levels were considered appropriate, although few respondents were in a position to comment on incentives for boilers and controllers. For the most part, the few who did respond were favorable towards the incentive levels. Other exceptions are ummarized below.

- One respondent thought that multifamily owners and property managers would not care about controller units even with high incentives because they want equipment to be up and running right now.
- One respondent recommended that incentives be based on 10% of the total installed cost of the equipment instead of the incremental difference.

4.3.5 Recommendations for Program Marketing

The utilities should promote the program through joint workshops with manufacturers, supply houses, and plumbers. The method most preferred would be a joint workshop with manufacturers, plumbing supply companies, and utility representatives, with plumbing contractors as the audience. Plumbing contractors note that they often go to their plumbing supply houses for information on new technologies, while plumbing supply companies go to the manufacturer. Manufacturers frequently offer seminars that plumbing contractors attend, and these are usually held at the plumbing supply locations. One plumbing supply contact mentioned that it would be good to have a utility representative at one of these meetings to explain the rebate programs.

The other two preferred methods of promotion were direct mail with brochures clearly outlining benefits (ten responses with two of these from plumbing suppliers) and phone solicitation (three responses).

Other factors related to promotion. Respondents emphasized that cost savings and ways to address upfront costs must be explicitly described to program participants. Other recommendations included the following.

- Focus on advertising program to the public, including owners and property managers (two responses),
- Have promotional material available to plumbing contractors and suppliers (two responses),
- Ensure that the application process is easy and fast for companies (two responses),
- Define program specifications clearly (e.g., who receives the rebate, what equipment qualifies, how long is the rebate in place) (two responses from plumbing suppliers),
- Work with manufacturers on issues related to energy efficiency of equipment (two responses from plumbing suppliers), and
- Help plumbing contractors, who do not typically up-sell their clients (i.e., they just install whatever the customer requests), in promoting the program (one response from a plumbing supplier).

4.3.6 Perspectives on Rebates

Rebates are viewed as being useful to trade allies. Fourteen of 16 respondents thought rebates could potentially be beneficial to them, primarily through increased sales and provision of additional benefits to their customers. Other comments related to this topic included the following.

- One respondent mentioned that he thought this would help multifamily owners attract tenants because their properties would have lower energy bills.
- Another respondent added the caveat that it would help with new construction sales but not retrofit because standard equipment cannot typically be changed to high efficiency equipment without changing ductwork and other accessories.
- In setting rebate procedures, it is important to include the distributor in the process. Five of the eight distributors said they deal directly with multifamily owners or property managers.

4.3.7 Additional Recommendations

Two past program examples were cited for their positive elements. Two respondents referenced past programs as favorable examples, including dealer promotions. SCG offered a local initiative program administered by ADM Associates two to three years ago in which ADM monitored sales and other activity related to high efficiency equipment. The rebate was offered directly to the wholesaler, who in turn passed a portion of the incentive on to the plumbing contractor. The respondent thought the program was successful, especially the monitoring component.

Utility Financing and Inspection

One respondent reported that approximately two years ago, PG&E and the Sacramento Municipal Utility District (SMUD) offered a program in which they financed upgrades to high efficiency equipment (he thought the program included furnaces, air conditioning, and other

equipment). They also trained their own inspectors to verify proper installation of the measures. The respondent thought the SMUD program was very successful because it resulted in very high quality installations—the customer was almost guaranteed to receive a high quality working system. Particularly, he mentioned that inspectors ensured the contractors not only installed high efficiency equipment, but also made sure all accessory equipment (e.g., ductwork) matched properly. This respondent contrasted this with his experiences in SCE's service territory, where he felt the lack of inspections resulted in poorly operating systems.

5. PROPERTY MANAGER FEEDBACK

Property managers represent the primary target market for the program. As such, the field research focused primarily on participating property managers' experiences, as well as the attitudes and awareness of non-participant property managers. There were two stages to this research. First, 27 participant property managers were interviewed in-depth. Then, based on findings from these interviews, a survey instrument was drafted for use in a broad-based telephone survey with 300 property managers throughout the state.

Key findings from these efforts, taken together, provide the following key findings.

- Market penetration of energy efficiency measures in multifamily properties is low, indicating plenty of market potential for this program.
- Program awareness is low for the multifamily program.
- The gas and electric markets are similar with respect to low program awareness levels.
- Managers of mid-sized properties in particular are prone to having no knowledge of the program.
- Contractors and vendors are playing a central role in alerting property managers to the availability of the program.
- Installed cost is the key decision criterion and is frequently a barrier to efficiency upgrade activity in the multifamily market.
- Most property managers place greater decision-making emphasis on low first cost and quick execution of a job, rather than energy efficiency.
- Participants may have more sensitivity to energy costs than non-participants may.
- More streamlined decision-making processes may differentiate participants from non-participants.
- Managers approached by the vendor typically did not make the final decision, but referred the vendor to the property management company or property owners.
- Market interest in energy efficiency appears strongest for appliances and lighting measures, but this interest is influenced by rebate availability.
- Most participating property managers were satisfied with their experiences in the MFRP.
- All dissatisfaction recorded in this research was attributable to participants who had lighting measures installed.
- Property managers would like to see incentive for a wider array of measures.
- Gas customers find the qualifying measures in the MFRP less appealing than other customers.

5.1 Participating Multifamily Property Manager In-depth Interviews

5.1.1 Overview

Three data collection efforts obtained information from multifamily property owners and managers (collectively referred to as "managers"). In-depth interviews were conducted in May and June with 19 property managers. Additional in-depth interviews were conducted with eight

property managers in September to specifically address issues related to participation for gas measures.

The responses to the initial in-depth interviews were used to refine the participant and non-participant survey instruments. The additional in-depth interviews addressed issues related to participation for gas measures.

While these initial depth interviews focused on specific projects, in several cases the property contact also discussed other energy efficiency projects completed prior to or concurrent with this installation. These findings are followed by results from the participant and non-participant property manager interviews.

5.1.2 Multifamily Characteristics

Housing varied in the number of units, price range, and tenant demographics. While most were middle income, some were predominantly low or fixed income tenancies. The one condominium complex contacted was described as a luxury facility.

Thirteen of the 19 projects were lighting-only, three were boiler replacements, one was a water heater replacement, and two included insulation, with one of these also replacing windows, appliances, and HVAC equipment.

5.1.3 Initial Interest

Responses indicate that almost all initial interest resulted from marketing by the vendor.

- In the 11 cases where details of the initial contact were known, 10 respondents indicated that the vendor initiated contact and presented program information. In the one other case, the respondent installed an efficient water heater in response to a utility presentation at an apartment owner's association meeting.
- In 10 cases, a vendor approached the property manager.
- In one case, a utility representative made a presentation after a vendor initialized contact.
- In four cases, upper management or purchasing made the decision and instructed the property manager to make basic arrangements, such as notifying tenants.
- In one case, a tenant initiated program participation.
- In three cases, the program work occurred before the arrival of the property manager, who did not know how the decision was made.
- Only one respondent recalled learning of the program before being contacted by a vendor. That manager recalled seeing "some info cross his desk."

5.1.4 Decision Process

- Managers approached by the vendor typically did not make the final decision, but referred the vendor to the property management company or the property owners.
- In seven cases, the decision to participate was influenced by the desire to replace failing or broken equipment or upgrade existing insulation. The equipment and fixtures varied by type (water heater, outdoor lighting, indoor lighting, and boilers).
- For two of the three boiler projects, the decision to participate was based on the need to comply with AQMD regulations.

- Only one project, a boiler replacement project at a condominium, was known to have gone out to bid. Lighting measures were free to the property owner and respondents saw no reason to request bids.

5.1.5 Measures Installed

Most respondents receiving lighting services reported problems with the installed fixtures and/or lamps. While most of these problems have been corrected to the satisfaction of the property owner, in many cases reinstalling fixtures caused unexpected work for property staff and additional inconvenience to tenants. Even though light fixtures and lamps to date are still under warranty and subject to replacement at no cost, tenants and property owners may be dissatisfied by the cost and inconvenience of premature replacement after the warranty period.

Lighting

- Most (13 of the 19) installations were lighting, mostly tenant lighting and outdoor lighting in cases where it had not been done previously.
- Two projects installed CFL screw-ins with no fixture changes.
- Five lighting projects included common area lighting.
- In 10 of 13 cases, lamps failed prematurely and the response has varied. In one case, the vendor provided a more reliable brand of bulb. In another case, the property manager shipped failed bulbs back to the manufacturer for replacement. There is a two-week lag between returning failed bulbs and receiving replacement bulbs. Another manager said the contractor was slow in replacing bulbs that failed shortly after installation.
- In five of 13 cases, fixtures have failed. The vendor typically replaced these, but in one case, the property owner is replacing failing CFL fixtures with fixtures for incandescent bulbs. In one case, the fixtures came off the ceiling but were reinstalled by the property's maintenance staff.
- The property manager of a senior housing unit was very concerned about the low light levels in the apartments and hallways from the new lighting. Another manager with elderly tenants said several of them were concerned about the dim lighting.

Other Measures

- The SCG projects were two boiler replacements, one water heater replacement, and one insulation project. There were no negative comments about the quality of installation or measure performance. One respondent described the boiler replacement as having the "expected hiccups" from a new system, but considered them her staff's responsibility to address.
- Vendors who had previously done work for the property initiated several of the projects.

5.1.6 Willingness to Pay for Measures

- For the 13 lighting projects, five respondents did not know if the decision makers would have been willing to pay for measures. Three stated that they would pay for tenant lighting fixtures if they could make the change out at the time of tenant turnover. Four stated that they would not have paid more for measures. The manager of a 160-unit complex said that replacing the lighting in tenant units at any cost would have been

prohibitive. Another said they received poor quality fixtures and would now, knowing this, refuse them.

- All three boiler installers would have been willing to pay. Two would pay because they were installing to comply with air quality regulations and the third because the boilers were broken.
- The water heater installation replaced a broken one. The owner said he would have bought a cheaper, less efficient water heater if the rebate were not available.

5.1.7 Access to Tenant Property

- Access was not generally a problem. Most had a policy allowing access to units with 24 to 48 hours notice. One manager noted that he felt the need to have property staff accompany contractor personnel whenever they entered a tenant unit.
- Three respondents stated that tenants were quite inconvenienced because units needed to be accessed multiple times. In one case, this was because approval was apparently by fixture type and installation happened after approval of each fixture. In the two other cases, units had to be accessed repeatedly for fixture or lamp replacement.

5.1.8 Tenants

- Tenants pay for their own electricity and property managers saw providing energy efficient lighting as a service to the tenants. Managers also saw this as an opportunity to update equipment.
- For the most part, people found the new fixtures attractive and a few indicated that the look of the lighting fixtures was a program benefit. A few respondents considered the fixtures installed at their property cheap and unattractive.
- Because the lamps are still under warranty, in cases where they have failed the installer or lamp manufacturer has generally provided replacement at no cost. In one case, the property management purchases replacement bulbs to avoid inconvenience.
- In most cases, the property has historically provided bulbs when old ones burn out.
- In one of the two cases where only lamps were installed, the property manager plans to replace them with incandescent lights when they burn out due to the relatively high first cost of CFLs.
- In the cases where lamps are functioning well, there may be some property owner dissatisfaction when it becomes necessary to replace the lamps due to the cost and, in some cases, the scarcity of replacement bulbs.

5.1.9 Impacts

- The property managers do not see the direct impact of the energy savings in tenant areas, as the tenants pay the utility bills. However, several did say that the tenants were happy with the savings.
- Only one of the five property managers where common area lighting had been installed spoke of specific savings due to installation in this area. He noticed minor savings on utility bills
- One property manager mentioned that financials indicated a major savings in the gas bill. The others who had gas boilers installed assumed that savings were being achieved but had not checked to see if there was a reduction in their gas bill.
- Property managers spoke of impacts other than energy.

- Two of the three participants in boiler replacement projects spoke of compliance with AQMD regulations as a significant result.
- For lighting, several commented on the benefit of having replaced old fixtures with attractive new ones.
- One manager expects to see fewer service calls for replacing lamps.
- A property manager who had outdoor lighting installed spoke of better outside security resulting from replacing broken or missing outside fixtures.
- A few said that having matching lighting fixtures is a benefit.
- While a few noted brighter lighting as an impact, the manager of a senior housing facility said that the lighting in the units and hallways is now dimmer, which has made it difficult for tenants to see and gave the property the feeling of a ”seedy old hotel.”

5.1.10 Best Way to Contact

Owners and managers mentioned a variety of ways to contact them. Most mentioned mail or e-mail from the utility, followed by contacts from vendors. It should be noted that almost all heard about this program first through a call or a visit from a vendor.

Table 5-1: Best Way to Contact Owners and Managers

Contact	Responses *(multiple responses permitted)*
Mail	7
E-mail	5
Vendor	4
Website	2
Fax	2
Telephone	2
Ads through home stores	1
Landlord association mailing	1

5.1.11 Recommendations

Eight respondents recommended improvements for the program, and some made multiple recommendations.

- Four recommended improving fixtures and bulbs to reduce problems or lessen failures.
- One was disappointed that more measures were not available, especially since the same vendor had offered a wide variety of fixtures the previous year.
- Two felt that improved pre-testing of fixtures and lamps would have lowered the failure rate, and that the vendor could have communicated better with tenants about the installations and about replacements.
- One respondent felt that the installers should remove the replaced ballasts from the premises. She noted that the installers did not remove the replaced fixtures and that the property had donated the fixtures to Saint Vincent de Paul, making it likely that they are

still in operation. It was noted in the review process that MFRP does not offer ballast replacement.
- One suggested that installers provide replacement lamps and fixture parts, either at the time of installation or as needed.
- Another manager, who only had common area lighting installed, recommended that weatherization measures and appliance replacement should be added.

5.1.12 Interest in Other Programs

- Thirteen respondents were interested in efficient coin-operated washing machines, but 11 of the 13 noted that a vendor owned their washing machines. Another noted that washers do not fail often and they would not replace a washer before failure.
- Based on side comments from the property managers, it appears that the properties usually provide the water and electricity for the washers and electricity or gas for the dryers.
- Nine respondents expressed interest in a refrigerator replacement program.
- One respondent suggested an outdoor floodlighting program.
- Another suggested a program to replace additional tenant lighting.
- Respondents tend not to be proactive in pursuing energy efficiency programs. In several cases, respondents indicated that maintenance and improvement decisions have a short timeframe and that they do not look for utility programs in which to participate.

5.1.13 Previous Energy Efficiency Measures

- Several respondents believed that the utility had provided some form of assistance in the past, but did not mention specific measures.
- Respondents looked at projects differently than do some of the utilities. Respondents tended to view multiple projects occurring simultaneously or sequentially at a single complex as a single project, whereas some utilities record these as several projects.

5.1.14 Length of Experience as a Property Manager

- Length of experience as property manager ranged widely, from 1.5 to 30 years (below). Seven of the 18 respondents had been property managers for less than five years, while 11 have been property managers for five or more years.
- Tenure at a given property was comparatively low. Nearly all (13 of 19) had been managing the properties of interest less than five years, with 10 managing the property two years or less.
- This short time as property manager at a given location appears to be typical. Several interviews were terminated because the properties contacted had new management in place and could not provide staff familiar with the project.

Table 5-2: Property Manager Experience

Time as a property manager	Length of time at that site	Overall length of time as a property manager
2 years or less	10	6
Over 2, less than 5 years	3	1
5 to 10 years	1	5
11 to 20 years	4	3
21 to 30 years	0	3

5.1.15 Barriers to Considering Future Program Participation

Responses varied and reflected the time and financial pressures faced by property managers.

- Of the 10 identifying barriers to participation, three mentioned difficulty in finding information about programs, two mentioned cost, and two mentioned the commitment of time required to make the program happen at their site.
- One identified the need for a program to provide multiple benefits—to the owner, the tenants, and the property—as a barrier.
- Two respondents mentioned the challenge of convincing management to participate in the programs.
- One property manager said that there are no obstacles in considering a program because it is his job to make the property better.

5.2 Participant and Non-participant Multifamily Property Manager Surveys

5.2.1 Background and Approach

Participating property managers and owners were surveyed to assess awareness and opinions of the MFRP in this target market. The evaluation team surveyed 150 participants and 150 non-participants. This survey covered the following subjects.

- How respondents first learned of the program and overall recall of program marketing,
- Preferred marketing approaches,
- Aspects of the program that were attractive to them,
- Whether participant expectations were met,
- Satisfaction with the program overall and with the equipment installed,
- Perceptions of tenant satisfaction,
- Factors contributing to dissatisfaction, as applicable,
- Willingness to recommend the program to others,
- Measures and/or rebates that would be of interest, and
- Characteristics of respondents, their firms, and their facilities.

Copies of the questionnaires appear in Appendix A.

The study population for the participant survey consisted of participants in the PY2002 MFRP. The study population for the non-participant survey was developed from a purchased list of apartment buildings in the geographic areas served by PG&E, SDG&E, SCE, and SCG.

Surveys were conducted in summer 2003.

This chapter summarizes the overall findings from the participant and the non-participant surveys. In addition to generating overall findings, this evaluation analyzed results by property size, ownership and, for participants, by utility, type of measure installed, and respondent satisfaction with the program. The property size variable was broken down using data on number of housing units. Three categories were analyzed and compared:

- Small properties, defined as having fewer than 20 units,
- Medium size properties, defined as having 20-60 units, and
- Large properties, defined as having over 60 units.

Ownership of the property was divided into three categories: own only, manage only, and both own and manage the property. Utility assignments were based on the program records. Respondents were asked to limit all answers to the specific properties on record in the utilities' databases. The measure type analysis was divided into lighting versus non-lighting measures. Respondent satisfaction was examined by asking if the respondent's expectations for the program had been met. Statistically significant differences within these groups are highlighted in the following discussion.

Readers interested in reviewing the complete data tables are referred to the banners for the participant and non-participants survey results, which have been provided separately.

5.2.2 Respondent Characteristics

Overall, participant and non-participant populations were similar with respect to property ownership and the respondent's length of employment in the industry. In other respects, participants and non-participants differed, with non-participants having greater representation of larger (>60 units), three-story properties, and PG&E customers.

Notable differences between participants and non-participants relate to the individual decision maker turnover. Non-participant respondents were far more likely than participants were to have recently changed jobs: Forty-six percent had been in their current position for no more than two years (versus 21.3% among participants). Table 5-3 summarizes the characteristics of the participant and non-participant property managers surveyed in this research.

Table 5-3: Characteristics of Surveyed Participants and Non-participants

Characteristic	Participants		Non-participants	
Service area of property[4]	PG&E	16.0%	PG&E	39.4%
	SCE	36.7%	SCE	24.7%
	SCG	18.0%	SCG	9.4%
	SDG&E	29.3%	SDG&E	11.3%
			No answer	15.2%
No. of dwelling units at address	<20	27.3%	<20	9.3%
	20-60	32.7%	20-60	36.7%
	>60	36.7%	>60	52.0%
No. of stories at address	1	6.0%	1	9.3%
	2	72.7%	2	65.3%
	3	10.0%	3	18.7%
	4+	7.3%	4+	6.7%
Ownership/management of property	Own only	2.7%	Own only	4.0%
	Manage only	36.0%	Manage only	44.0%
	Own & Manage	58.7%	Own & Manage	51.3%
Mean no. of multifamily properties in CA	Owned only	14.7%	Owned only	1.0%
	Managed only	3.5%	Managed only	10.4%
	Owned & managed	22.8%	Owned & managed	14.4%
No. of years in current job position	1 – 2	21.3%	1 – 2	46.0%
	3 – 4	23.3%	3 – 4	14.0%
	5 – 9	19.3%	5 – 9	23.3%
	10 – 19	17.3%	10 – 19	13.3%
	20+	15.3%	20+	3.3%
	Mean	9.3 years	Mean	5.1 years
No. of years in multifamily property management	3 – 4	11.3%	3 – 4	15.3%
	5 – 9	19.3%	5 – 9	28.0%
	10 – 19	29.3%	10 – 19	24.7%
	20+	26.0%	20+	18.0%
	Mean	14.2 years	Mean	11.1 years

Because property managers dominate this sample population, this study population will hereafter be referred to as property managers.

5.2.3 Adoption of Energy Efficient Technologies

These surveys asked respondents if any energy efficient measures had been installed at their properties previously. The reader is cautioned that, historically, self-reported survey data have been found to be inaccurate indicators of adoption rates in the market, with a tendency toward overstating actual penetration. Therefore, these results should be considered an upper bound on market penetration levels and that findings be used more for comparative purposes for assessing which measures are used more widely rather than for estimating actual penetration rates.

The data from these surveys suggest that as much as one-third of the multifamily property market may have adopted one or more energy efficient measures, although no single measure type was reported to have been installed by more than 10% of the market. From the non-

[4] Utility service territory for nonparticipants was developed from two questions on whether the respondent would like additional program information and, if so, from which utility. These figures are, consequently, inexact in quantifying location of the nonparticipants' facilities.

participant surveys, the data indicate that the five most commonly used measures are hard-wired indoor fluorescent fixtures (10.0%), screw-in fluorescent bulbs (8.0%), high efficiency refrigerators (8.0%), hard-wired outdoor fluorescents (6.0%), and high efficiency water heaters (6.0%). Other measures were mentioned by fewer than 5% of respondents. Among participants, the only measure mentioned by more than 5% of the respondents was hard-wired indoor fluorescent fixtures.

One-third of non-participants and one-half of participants indicated plans to make some type of energy efficiency improvement in the future. Among non-participants, planned measures were mostly in the appliances and lighting areas. Among participants, lighting applications predominated. Table 5-4 contrasts the responses from these two groups.

Table 5-4: Plans for Future Efficiency Upgrades

Participants		Non-participants	
Outdoor Lighting	16.0%	ENERGY STAR Refrigerators	12.7%
Hard-Wired Fluorescent Fixtures	12.0%	ENERGYSTAR Dishwashers	8.7%
CFLs	8.6%	Hard-Wired Fluorescents	8.0%
ENERGY STAR Refrigerators	8.0%	EE Window/Wall Air Conditioning	7.3%
EE Air Conditioning	6.0%	CFLs	6.7%
Hard-Wired Lighting	6.0%		

It is interesting to note the greater frequency of reported plans to install lighting among program participants. Whether this is a difference based on property maintenance plans, facility needs, or is the influence of the program's design or marketing cannot be determined from the data collected in this survey.

5.2.4 Level of Interest in Utility Programs

Both participants and non-participants show interest in utility efficiency programs—90% and 82%, respectively, indicated that they would like their utility to send them information about "Programs currently available to multifamily property managers."

5.2.5 Awareness of Multifamily Rebate Program

Most nonparticipating property managers were unaware of the MFRP (62.7%).

Managers of larger properties were more aware of the program (41.0% aware), whereas awareness among managers of mid-sized properties was quite low (16.4%). More attention may need to be directed to program marketing to the mid-sized segment (properties of 20-60 units).

This low overall awareness may have resulted from the high turnover in job positions among the non-participants surveyed. If this turnover rate is found to be a persistent characteristic of this market, then it is clear that marketing and educational efforts need to be an ongoing part of program operations.

5.2.6 Program Marketing

Respondents were asked how they first learned about the MFRP and to identify all program marketing they could recall. Table 5-5 indicates that contractors and vendors play a central role in alerting property managers to the availability of the program, and were responsible for more initial awareness than all utility marketing combined.

Table 5-5: Recall of Program Marketing Among Participants

Marketing Approach	Recalled	First Learned	No recall
Brochures	38.7%	10.7%	50.7%
Bill stuffers	20.7%	6.7%	72.7%
Web pages	12.7%	4.0%	83.3%
Contractor	-	31.3%	-
Another property manager	-	6.7%	-
Headquarters or prior manager	-	5.3%	-
Utility representative	-	4.7%	-
Letter/fax/flyer		3.3%	
Other answers		11.2%	
Don't know		16.0%	

PG&E participants were more likely than others were to recall seeing an MFRP bill stuffer (41.7% vs. 20.7% overall). Managers of smaller units were more likely to report having first learned of the program in this manner (24.4% vs. 6.7% overall).

Among non-participants who could remember program-marketing materials, the relative recall of brochures and bill stuffers was similar to the recall levels among participants, with brochures being more commonly remembered. Few respondents reported seeing the utility website information and fewer reported learning of the program from contractors. The low number of referrals from contractors to the non-participant group is in sharp contrast to the participant group where approximately one-third of participants first learned of the program through contractors.

Respondents were also asked to indicate what marketing approaches would be best for reaching them. Both participants and non-participants were most likely to select direct mail as the best method of notifying them about the program. For participants, this was followed by bill stuffers. However, for non-participants the next choice of outreach methods was e-mail. Table 5-6 summarizes the findings for the more commonly selected notification methods.

Table 5-6: Best Methods for Reaching Property Managers and Owners (top mentions)

Method	Participants	Non-participants
Direct mail	43.3%	67.3%
Bill stuffers	38.7%	18.0%
Contractors/vendors	22.7%	16.7%
E-mail	19.3%	27.3%
Fax	14.7%	18.0%
Newspaper	12.7%	19.3%
Utility website	10.7%	15.3%

Among participants, the small-sized property managers were much more likely to mention bill stuffers than were managers of mid-sized or larger properties (63.4% vs. 36.7% and 23.6%, respectively) and were much less likely to identify vendors (9.8% vs. 30.6% and 25.5%, respectively). Managers of large properties were also more likely to select e-mail than others (30.9%). In fact, e-mail was their second preferred means of receiving program information after direct mail. These patterns did not hold up among non-participants, except for about one-third of large property managers who opt for e-mail as a second choice after direct mail. Among non-participants, large property managers are more likely than others to mention faxes and less likely to mention utility websites.

5.2.7 Attractive Program Features

Participants were asked which program features had interested them in the MFRP when they were deciding to enroll. Non-participants were asked which features are of interest to them now. Table 5-7 summarizes the overall results. All aspects investigated through the survey were of interest to property managers, but the ability to save energy costs was primary. Among non-participants, there was also strong interest in the rebate and in upgrading tenant units. It may be worthwhile to emphasize these themes in future marketing of the program.

Table 5-7: Program Features Which Were Viewed as Attractive

Feature of the Program	Participants	Non-participants
Opportunity to reduce energy costs	82.7%	86.0%
Ability to upgrade the building	64.7%	72.7%
Ability to upgrade tenant units	63.3%	78.0%
Rebate availability for measures	58.7%	76.7%
Types of improvements available	52.0%	72.0%
None of the above	1.3%	2.7%

Among participants, managers of larger properties were less likely to mention the ability to upgrade the building as a principal interest (although 50.9% still did mention this interest). In

contrast, at least seven out of 10 managers of small- and mid-sized properties were attracted to this. Within the large property segment, being able to upgrade tenant units was more attractive to these managers than upgrading the building overall (60.0% vs. 50.9%). Managers of mid-sized properties were more interested than large property managers were in both the rebate availability (69.4% vs. 47.3%) and the types of improvements available through this program (63.3% vs. 41.8%).

5.2.8 Information Needed

To investigate the importance of information barriers, non-participants were asked what types of questions they would have liked answered before agreeing to participate in the MFRP. By far, the most frequently mentioned issue was determining the cost of the installation. This received nearly four times the mention (43.3%) as the next most frequent concern, learning how to participate in the program (12.0%).

5.2.9 Decision Factors

Respondents who had participated in the 2002 MFRP were asked to identify what factors were considered in their decisions. Table 5-8 summarizes the responses for both common areas and tenant-occupied spaces.

Table 5-8: Factors Assessed in Participants' Decisions to Install Multifamily Rebate Program Measures

Factor	Considered in Common Area Installations	Considered in Tenant-Occupied Installations
Installation cost	68.8%	51.7%
Energy/money savings	26.0%	28.0%
Tenant acceptance or aesthetics	20.8%	18.6%
Repair and maintenance issues	11.7%	10.2%
Product quality	11.7%	7.6%
Upgrading facility	7.8%	6.8%
2005 deadline	2.6%	0.8%
Rebate offer/it was free	3.9%	5.0%
Installation difficulty	1.3%	1.7%

Overall, the data indicate similar decision considerations for common area and tenant-occupied spaces, with installed cost being by far the single most important consideration.

SCG participants were the only group to mention the 2005 deadline, which was considered by 9.1% of these property managers. SCG's participants were also more likely to highlight repair and maintenance issues as a consideration for common area installations (27.3%).

Small property managers were statistically more likely to cite repair and maintenance issues (50.0% for common areas jobs and 66.7% for tenant space jobs). However, the findings for this group were based on small sample sizes on these questions (n=4 and 3, respectively).

Among non-participants, product quality and the timing of the job's execution were more important considerations than for participants. Table 5-9 summarizes the data on this subject. A handful of respondents answered additional questions regarding barriers to program participation and measure installation. Based on the limited responses, it appears that disruption issues and the length of time are important barriers.

Table 5-9: Factors Affecting Non-participants' Decisions on Installing Efficiency Measures in their Properties

Factor	
Installation cost only	33.1%
Product quality	16.5%
Time frame	5.8%
Energy/money savings	5.8%
Repair and maintenance issues	4.3%
Upgrading facility	2.9%
Installation difficulty	2.9%
Tenant acceptance or aesthetics	1.4%
2005 deadline	0.7%
Rebate offer	0.7%
Don't know	23.0%

Data collected in a separate question indicate that about one-quarter of the market considers first cost only in assessing efficiency upgrade projects, with no consideration given to future energy savings, payback, or return on investment. Another one-sixth of the market considers the cost of energy efficiency upgrades so small as to not warrant formal analysis. Overall, half of the market considers first cost in relation to the projected savings of the measures. Table 5-10 provides more detail from the participant and non-participant surveys.

Table 5-10: Comparison of Participants and Non-participants in Methods Used to Assess Efficiency Upgrade Projects

Assessment approach	Participants	Non-participants
Total cost of installation	28.3%	25.4%
Total installed cost relative to projected savings on energy	43.4%	20.9%
Payback period	5.7%	19.4%
Return on investment	1.9%	10.4%
No need to assess because cost is so low	15.1%	17.2%
Other	5.7%	
Don't know	-	5.2%%

5.2.10 Decision Process

Data from the participant survey indicate that the type of decision makers involved in efficiency upgrade projects varies with facility size. The decision process in smaller buildings primarily involves the property owner (73.2% of decisions in buildings under 20 units). As property size increases, the decision is more likely to involve a property manager (83.6%). An owner is likely involved less than half the time in the largest properties (40.0% of decisions in properties of over 60 units). Data from the non-participants did not exhibit similar patterns, possibly because smaller properties were less represented in this sample. The strongest pattern among non-participants was the consistency of these decisions to involve multiple decision makers. Table 5-11 gives an overview of this result and demonstrates that program participants, in some cases, appear to have operated within a more streamlined decision-making environment.

Table 5-11: Decision Makers Involved in Efficiency Upgrade Decisions

Decision Maker Involved in Efficiency Upgrades	Participants	Non-participants
Property owner	54.0%	82.0%
Property manager	67.3%	62.6%
Supervisor at property management company	36.7%	50.4%
Purchasing manager at property mgmt. company	7.3%	20.9%
Board of directors	8.7%	14.4%

More streamlined decision-making processes may differentiate participants from non-participants. The data suggest non-participant decisions tend to involve more parties within the owner/manager organization.

It is worth considering whether the simpler decision process described by some participants is linked to the size of the efficiency investment and, consequently, to the size of the rebates offered. While this survey cannot directly document this, it is suggestive that by minimizing the first cost of qualifying jobs, the internal approval process was simplified. Interestingly, 46% of

participants indicated that they did not go through a process of requesting bids from contractors before engaging their vendor to install their efficiency measures.

Participants of SCG were significantly more likely to receive multiple bids for their program jobs than were participants in the SCE program. SCE participants were less likely to obtain any bids as compared to participants in SDG&E or SCG.

5.2.11 Participant Installations

According to the data reported by program participants, 20.0% installed measures in common areas only, 47.3% in tenant-occupied spaces only, and 31.3% in both common and tenant-occupied spaces. Interestingly, property size seems to correlate to the location of the measures installed in MFRP jobs. Small-sized managers were more than twice as likely as managers of mid- and large-sized properties were to have focused on common areas only (34.1% vs. 14.3% and 14.5%, respectively). Mid-size property managers were most likely to report focusing on tenant-occupied spaces only (63.3% vs. 34.1% and 45.5% for small- and large-sized properties, respectively). Large property managers were most likely to undertake upgrades in both common areas and tenant-occupied spaces (40.0% vs. 29.3 and 20.4%).

5.2.12 Energy Savings

Overall, 31.3% of participants reported a reduction in their energy bills since the program measures was installed, 14.7% reported no reductions, and the remainder did not know if any bill savings had been realized. Half reported that they themselves did not have the information to assess this outcome.

One quarter of participants reported that tenants had seen reductions in their bills.

5.2.13 Willingness to Recommend Program

Overall, 86.7% of participating property managers would recommend the MFRP to another property manager. Respondents most likely to recommend the program were SCG participants (100%), managers of small properties (97.6%), and managers involved with installations of non-lighting measures (100%).

5.2.14 Areas of Opportunity

The non-participant questionnaire explored market receptivity to several measure-rebate possibilities. It is worth noting that most non-participants were interested in one or more of the efficiency rebate options tested in this study. Fewer than 10% were not interested in any rebate option. This suggests significant opportunities for the program among the non-participant population.

Non-participants were asked about their interest in installing a number of measure types under specific rebate scenarios. For tenant-occupied spaces, the most popular options were as follows:

- ENERGY STAR ceiling fans with a rebate of $20/fixture (58.0% interested),
- Screw-in fluorescent lamps with a rebate of $2/lamp (54.7%),
- Hard-wired fluorescent porch lights with a rebate of $30 (52.0%),

- ENERGY STAR dishwashers with rebate of $50 (50.7%),
- Hard-wired fluorescent fixtures in tenant-occupied spaces with a rebate of $60 per fixture (50.0%), and
- ENERGY STAR programmable thermostats with a rebate of $20 apiece (50.0%).

For common areas, non-participants favored the following installations:

- Energy efficient water heaters with a rebate of $500 per unit (59.3%),
- Energy efficient air conditioners or heat pumps with $500 rebate (56.7%), and
- Screw-in fluorescent lamps with a rebate of $2 each (52.0%).

Other options proposed received interest from less than half of the non-participants surveyed.

Fewer measures were tested in the participant questionnaire. Participants were interested in incentives for refrigerators (66.7%) and coin-operated clothes washers (48.0%). It is likely that if additional options had been tested with participants, they too would be found to have potential. When asked what recommendation participants would offer to improve the program, one of the most common responses was to have more items qualify for rebates.

5.3 Property Manager Satisfaction

5.3.1 Top-Level Assessment of Participant Satisfaction

As a first step, overall program satisfaction of the participants was analyzed across a number of survey questions. Specifically, participating owners and managers were asked the following:

- Were they satisfied with the overall quality of work completed by the contractor?
- Were they satisfied with the performance of the equipment installed?
- Were tenants satisfied with the equipment installed?
- Did the program meet their expectations?
- Would they recommend this program to other property managers?

While most participants were satisfied with their experiences, there was a dissatisfied segment. In particular, it was apparent that some who had installed lighting were not satisfied with the measures installed in PY2002. Table 5-12 highlights some of these findings. The discussion that follows provides more detail from these questions.

Table 5-12: Comparison of Satisfaction Levels Among Participants Installing Lighting and Other Measure Types

Satisfaction Indicator Variable	All Participants	Lighting Measures Only	Nonlighting Measures Only	Lighting and Nonlighting Measures
Satisfied with work of contractor	76.0%			
Satisfied with equipment	72.0%			
Tenant Satisfaction	64.4%			
Expectations for program were met	82.7%			
Satisfied with all aspects and expectations were met		58%	80%	70%

Overall Satisfaction with Contractor Work

Most participating property managers reported being satisfied with the work done by the contractors for the MFRP. On a five-point scale, where 5 represented "extremely satisfied," 76.0% said their satisfaction with "the overall quality of the work completed by the contractors" as a 4 or 5. However, 7.3% rated their reaction as "not at all satisfied," the lowest possible rating. Overall, 11.3% of respondents rated contractor performance negatively.

Some groups clearly were more likely to report dissatisfaction with their contractors. These groups were disproportionately represented among the dissatisfied and included those making installations in tenant-occupied spaces, managers of mid-sized properties, and participants in the SDG&E area. Using a rating of either 1 or 2 to indicate a dissatisfied participant, results show that managers involved with tenant space installations were more than five times as likely to report being dissatisfied (14.4% vs. 2.6%) as those not involved with tenant space installations. Even more striking, 22.4% of mid-sized property managers reported being dissatisfied along with 25.0% of SDG&E participants. It is noteworthy that none of the SCG participants reported being dissatisfied with MFRP contractors and only 2.4% of the small property managers were dissatisfied. *Most noteworthy is the fact that all dissatisfaction on this indicator was attributable to participants who had lighting measures installed. Participants who did not install lighting measures were all satisfied with their contractors.*

The three most prevalent reasons for being dissatisfied were that the lighting equipment broke, the installers did not meet the standards of the participant, and the lighting equipment quality was substandard. Dissatisfied customers in SDG&E's area were much more likely to mention equipment breakage; more than half identified this as a problem.

Satisfaction with Equipment Installed

Nearly three-quarters (72.0%) of participants indicated that they were satisfied with the performance of the equipment installed, 12.0% were dissatisfied, and 15.3% gave a neutral rating. Again, satisfaction levels of SDG&E participants lag behind those of PG&E and SCG customers (52.3% vs. 83.3% and 88.9% satisfied, respectively). SCE participants fell in the middle (74.5%) and were not statistically different from others. Again, installations in tenant-occupied spaces were more unsatisfactory than those in common areas (15.3% vs. 5.2%).

Managers of small properties were more likely to be satisfied with the performance of the equipment installed (87.8% vs. 65.3% and 65.5% for medium- and large-sized properties, respectively). Again, all dissatisfaction with equipment performance was associated with lighting measures.

Another follow-up question asked respondents to identify reasons for dissatisfaction with equipment performance. The top three reasons mentioned were that the lighting equipment broke, the quality was substandard, and the bulbs burned out quickly.

Expected vs. Actual Program Experiences

Participants were asked whether their expectations for the MFRP were met. Overall, 82.7% felt their expectations were met, while 11.7% did not. This pattern was distinctly more negative for SDG&E customers and for participants in mid-sized and large facilities. More than one-third of SDG&E participants (34.1%) indicated that the program failed to meet their expectations. Lighting recipients were twice as likely to report failure to meet expectations as those installing non-lighting measures. Mid- and large-sized facility managers were uniform in their reaction to the program—22.4% and 21.8% felt it failed to meet expectations. However, small-sized property managers were more positive—only 2.4% shared this view.

Reasons given for the negative reaction to the program tended again to focus on equipment quality and performance issues, with a lack of realized savings also factoring in. Of note is that none of the SCG participants complained about equipment performance or quality concerns.

Tenant Satisfaction

For installations in tenant-occupied spaces, property managers were asked to assess tenant satisfaction. Overall, nearly two-thirds of these property managers reported that their tenants were satisfied, while 15.3% indicated that their tenants were not. Tenant dissatisfaction appears to significantly influence property managers' feelings that the program failed to meet their expectations. Fourteen of 24 such property managers reported their tenants were dissatisfied.

As with other satisfaction indicators, all reported tenant dissatisfaction was attributable to lighting measure installations.

Top reasons given for tenant dissatisfaction were equipment that failed, substandard equipment quality, and the short life for bulbs installed.

Among those whose tenants were satisfied, the top reason was reduced energy bills. This was cited more than three times as often as the next most frequent responses. PG&E participants were more likely than other groups to cite improvements in comfort as well, and this factor turned out to be nearly as important as bill savings in the small property segment.

5.3.2 Compound Analysis of Participant Satisfaction

A more detailed analysis of the above findings revealed that participant responses for these elements of satisfaction were not highly correlated. For example, participants indicated that expectations were not met, yet gave high satisfaction ratings on other indicators. When looking

at the variable on whether they would recommend the program to others, participants were found who were dissatisfied with one or more program elements but would recommend the program to other property managers. Therefore, as the results were examined in more detail, the evaluation team decided to create a compound variable, "Completely Satisfied," that incorporated all five indicators to contrast the more thoroughly satisfied customers with the remainder. To be completely satisfied, a positive response was required to each of the five satisfaction questions. This variable serves to separate those respondents with no complaints about the program from those voicing any complaint or a lack of willingness to recommend the program to others.

Overall satisfaction was examined from three perspectives:

- Overall satisfaction by utility,
- Overall satisfaction by type of measures installed, and
- Overall satisfaction by contractor.

Overall Satisfaction by Utility

Table 5-13 shows the breakdown in compound satisfaction by utility. Overall, only 62 % of the participant respondents were "Completely Satisfied" (a positive response to all five satisfaction questions) with the program and would recommend it to others.

Table 5-13: Overall Satisfaction with Program and Its Components by Utility

	UTILITY				
	PGE	SCE	SCG	SDG&E	Total
Not Completely Satisfied	7	20	6	24	57
Completely Satisfied	17	35	21	20	93
Percent Satisfied	71%	64%	78%	45%	62%

Overall Satisfaction by Measure Type

Table 5-14 shows the compound satisfaction by type of measures installed. The survey results indicate a strong sense of dissatisfaction among property managers, most particularly those involved with lighting measures. As the responses and the detailed verbatim answers illustrate, the problems cover all lighting issues ranging from premature burnout, poor quality of fixtures, poor installation, and inadequate lighting to less than fully professional and responsible contractors. Examining the overall satisfaction indicator by type of measure installed found that participants who installed non-lighting measures were substantially more likely to report satisfaction with the program than participants who installed lighting.

Table 5-14: Overall Satisfaction by Measure Type

	Not Completely Satisfied	Completely Satisfied	Percent Satisfied
Lighting Only	47	58	55%
No Lighting Measures	7	28	80%
Lighting and Other Measures	3	7	70%
Total	57	93	62%

Overall Satisfaction by Contractor

Table 5-15 summarizes findings regarding overall satisfaction relative to the contractor hired to complete the installation. With so many contractors represented by only one application, it is difficult to ascertain patterns in the data for more than half of the individual firms. However, among those submitting 15 or more applications in 2002, the low satisfaction ratings of two firms are noteworthy. Only one-third or fewer of the customers doing business with these firms were satisfied completely with their experiences in the MFRP.

Table 5-15: Overall Satisfaction by Contractor

Contractor	Not Completely Satisfied	Completely Satisfied	Percent Satisfied
1	13	3	19%
2	12	6	33%
3	3	4	57%
4	11	26	70%
5	13	40	75%
6	1	1	50%
7	0	2	100%
8	1	0	0%
9	1	0	0%
10	1	0	0%
11	1	0	0%
12	0	1	100%
13	0	1	100%
14	0	1	100%
15	0	1	100%
16	0	1	100%
17	0	1	100%
18	0	1	100%
19	0	1	100%
20	0	1	100%
21	0	1	100%
22	0	1	100%

6. ON-SITE ASSESSMENT

The purpose of the on-site assessment is as follows:

- Quantify the proportion of measures still in place and operational after the first year, and
- Observe any installation or operational issues with the measures in place.

It is important to recognize that this is neither a savings persistence study nor a retention study. A persistence study assesses changes in net program load impacts over time. A retention study is an assessment of (a) the length of time the measure(s) installed during the program year are maintained in operating condition; and (b) the extent to which there has been a significant reduction in the effectiveness of the measures(s).[5]
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Perhaps the largest area of uncertainty with respect to measures rebated is their disposition and utilization. Therefore, the evaluation plan included 125 on-site surveys of apartment complexes and mobile home parks to determine how the rebated measures are being used. In this task, Itron, with the on-site assistance of ASW Engineering, verified measures installed through the program using on-site surveys.

6.1 Methodology

The on-site assessment methodology has three elements: sample design, data collection, and analysis.

6.1.1 Sample Design

The sample design process involved three tasks: review of the program implementation databases, a sample design for conducting the on-site surveys, and verification of the samples selected.

California Multifamily Energy Efficiency Rebates Program Databases

The four California utilities provided MFRP participant databases. The structure of the databases varied significantly. The project team identified sufficiently common elements in each database to facilitate a sample design for the on-site verifications of measures installed through the program.

The project team decided to use a proportional sampling approach for the sample design. The sample is proportionate to the number of complexes and the location of the installed measures. Table 6-1 describes the databases. The sample design was developed using the steps described below.

[5] Appendix A M&E Protocols and Procedures

The project team used a count of the unique application or site codes by utility to determine the total number of complexes. A complex is a single location with one or more multifamily buildings.

Table 6-1: California Multifamily Database

Utility	Complex Description				Total Number of Complexes
	Only Apartments Treated	Only Common Areas Treated	Apartments and Common Areas Treated	Mobile Home Complexes	
PG&E	137	62	23	2	224
SCE	296	2	7	0	305
SCG	56	173	3	0	232
SDG&E	117	23	0	0	140
Total	606	260	33	2	901

To ensure a wide range of measures, it was necessary to distinguish between complexes with measures only installed in apartments, only installed in common areas, or installed in both common areas and apartments. All of the IOUs have location variables in their tracking databases, however, the level of detail was not sufficient to accurately describe were individual measures can be found for verification purposes. To determine measure locations, the team developed a multifaceted approach based on measure descriptions.[6]

Table 6-2: PG&E Program Database Totals

Area	Rebates ($)	KWh	Therms
Apartments Only	843,340	1,225,703	10,502
Both Apartments and Common Areas	118,781	989,186	2,446
Common Area Only	99,796	407,126	57,154
Mobile Homes	650	1,469	0

[6] PG&E divided its properties into apartment complexes, homeowners' associations, and mobile home parks. All installed measures in a homeowners' association were assumed to be complex measures. The other utilities did not provide information on the type of property.

Table 6-3: SCE Program Database Totals

Area	Rebates ($)	KWh	Therms
Apartments Only	1,131,802	5,333,495	
Both Apartments and Common Areas	15,944	88,303	
Common Area Only	230	2,170	

Table 6-4: SCG Program Database Totals

Area	Rebates ($)	KWH	Therms
Apartments Only	24,407	66,256	10,967
Both Apartments and Common Areas	4,025	2993	3,217
Common Area Only	502,250	0	278,214

Table 6-5: SDG&E Program Database Totals

Area	Rebates ($)	KWH	Therms
Apartments Only	994,060	1,316,949	28
Common Area Only	116,117	12,189	163,351

PG&E provided limited information on property type and the area of installation.[7] For the remaining three utilities, the team used information from the utilities' rebate forms (i.e., apartment improvements, common area improvements, mechanical area improvements, and high efficiency central cooling and heating improvements) to determine location. If described as an apartment or common area measure on the utility's rebate forms, the team assumed the measure had been installed in the appropriate location. Measures listed on the high efficiency central (HEC) cooling and heating rebate form were assumed installed in the common area. The team examined individual measures from the mechanical improvements rebate form and placed them in either apartments or common areas.[8] Complexes designated as having both common and apartment measures had multiple types of measures installed, with at least one falling into the common and the apartment designation. Table 6-1 lists the distribution of apartments only, common area only, and both apartments and common area.

Sample Design

Table 6-6 provides information on the targeted sample. First, the team determined that the targeted sample would consist of 125 complexes. If the location description for a given utility

[7] PG&E has subsequently indicated that this information is documented, however, it was not made available prior to conducting the on-site assessment.

[8] For PG&E, the dataset's location variable was used when it was provided. If the location variable was not available, location classification was completed using the utility's rebate forms. If PG&E's location variable indicated an apartment measure was installed in a homeowners' association, the location was changed to indicate that the measure was installed in a common area.

had few participating complexes, the complex was chosen to be a member of the target sample.[9] For complex descriptions with more than five original members, the sample was chosen proportionate to the total number of complexes.

The SCG and SDG&E previously verified 100% of their measure installations, while SCE and PG&E verified 5%. Given their prior inspection work, the SCG and SDG&E were sampled at a rate half as large as their database proportion. PG&E's and SCE's sample sizes were increased proportionate to their original database fraction to maintain a sample size of 125 complexes.

Once the sample sizes were determined, the samples were randomly drawn within each stratum. To ensure that the designated number of complexes could be found, the on-site survey team was supplied with a randomly drawn list of complexes three times as large as the targeted sample.

Table 6-6: California Multifamily Targeted Sample Design

Utility	Complex Description				Total Sample Size
	Only Apartments Treated	Only Common Areas Treated	Apartments and Common Areas Treated	Mobile Home Complex	
PG&E	24	11	5	2	42
SCE	48	2	5	0	55
SCG	5	9	3	0	17
SDG&E	6	5	0	0	11
Total	83	27	13	2	125

Sample Verification

To ensure that the targeted samples contained an appropriate mix, the measures installed listed in the databases were compared to those included in the selected samples. Table 6-7 through Table 6-10 provide a list of the measures installed by utility, location, and end use in the databases. Table 6-11 through Table 6-14 provide a list of the measures installed by utility, location, and end use in the sample provided to the on-site survey team.[10]

[9] For example, PG&E's two mobile home parks and all three of SCG's complexes with both apartment and common areas were explicitly included in the sample.

[10] The number of measures to be verified by the on-site survey team will be less than the number of measures listed in Table 6-11 through Table 6-14. These tables list the measures found in the sample including replacements. The total number shown is three times as large as the target sample.

Table 6-7: Measures Installed in the PG&E Program Database

Area	Measures Installed	Measure Type							
		Appliance	HVAC	Indoor Lighting	Insulation (Ft^2)	Lighting Control	Outdoor Lighting	Water	Window (Ft^2)
Apartments Only	152,632	105	67	12547	126,015	0	1,878	43	11,977
Both Apartments and Common Areas	40,412	0	6	27476	0	36	500	24	12,370
Common Areas Only	56,866	1	70	8707	40,993	63	582	8	6,442
Mobile Homes	13	0	13	0	0	0	0	0	0

Table 6-8: Measures Installed in the SCE Program Database

Area	Measures Installed	Measure Type							
		Appliance	HVAC	Indoor Lighting	Insulation (Ft^2)	Lighting Control	Outdoor Lighting	Water	Window (Ft^2)
Apartments Only	139,760	0	89	131,948	0	0	7,723	0	0
Both Apartments and Common Areas	453	0	246	195	0	5	7	0	0
Common Areas Only	23	0	0	0	0	0	23	0	0

Table 6-9: Measures Installed in the SCG Program Database

Area	Measures Installed	Measure Type							
		Appliance	HVAC	Indoor Lighting	Insulation (Ft^2)	Lighting Control	Outdoor Lighting	Water	Window (Ft^2)
Apartments Only	39,015	42	21	0	37,929	0	0	1023	0
Both Apartments and Common Areas	335	0	8	0	0	0	0	327	0
Common Areas Only	403	0	352	0	0	0	0	51	0

Table 6-10: Measures Installed in the SDG&E Program Database

Area	Measures Installed	Measure Type							
		Appliance	HVAC	Indoor Lighting	Insulation (Ft^2)	Lighting Control	Outdoor Lighting	Water	Window (Ft^2)
Apartments Only	16,608	2	0	16,526	0	0	80	0	0
Common Areas Only	195	0	148	42	0	5	0	0	0

Table 6-11: Measures Installed In the PG&E Sample[11] Provided to On-Site Surveyors

Area	Measures Installed	Measure Type							
		Appliance	HVAC	Indoor Lighting	Insulation (Ft^2)	Lighting Control	Outdoor Lighting	Water	Window (Ft^2)
Apartments Only	94,917	61	32	6,220	80,528	0	1,102	4	6,970
Both Apartments and Common Areas	17,231	0	6	16,526	0	27	343	24	305
Common Areas Only	49,781	0	43	8,366	40,993	33	342	4	0
Mobile Homes	13	0	13	0	0	0	0	0	0

Table 6-12: Measures Installed In the SCE Sample Provided to On-Site Surveyors

Area	Measures Installed	Measure Type							
		Appliance	HVAC	Indoor Lighting	Insulation (Ft^2)	Lighting Control	Outdoor Lighting	Water	Window (Ft^2)
Apartments Only	65,309	0	57	61,648	0	0	3,604	0	0
Both Apartments and Common Areas	453	0	246	195	0	5	7	0	0
Common Areas Only	23	0	0	0	0	0	23	0	0

[11] This includes the replacements drawn at the same time as the primary sample.

Table 6-13: Measures Installed in the SCG Sample Provided to On-Site Surveyors

Area	Measures Installed	Measure Type							
		Appliance	HVAC	Indoor Lighting	Insulation (Ft^2)	Lighting Control	Outdoor Lighting	Water	Window (Ft^2)
Apartments Only	12,331	10	2	0	12,312	0	0	7	0
Both Apartments and Common Areas	335	0	8	0	0	0	0	327	0
Common Areas Only	87	0	75	0	0	0	0	12	0

Table 6-14: Measures Installed in the SDG&E Sample Provided to On-Site Surveyors

Area	Measures Installed	Measure Type							
		Appliance	HVAC	Indoor Lighting	Insulation (Ft^2)	Lighting Control	Outdoor Lighting	Water	Window (Ft^2)
Apartments Only	2,353	0	0	2,353	0	0	0	0	0
Common Areas Only	152	0	105	42	0	5	0	0	0

Table 6-15 through Table 6-18 present the fraction of database measures in the on-site survey sample. If there were no measures installed in the database, the cell is empty. If a measure was installed in the database but not present in the sample, a zero is entered in the cell.

Locations with few complexes, such as PG&E's mobile homes and SCE's complexes with only common area installations, were census sampled. These locations have 100% of their sites and measures provided to the surveyors for verification. The fraction of measures contained in the on-site survey for SDG&E and SCG is smaller than the fraction for PG&E and SCE by design. SCG and SDG&E previously underwent 100% verification of installed measures, reducing the need to verify current measure status. The Sempra utilities previously underwent 100% inspection of installed measures, reducing the need for evaluating measure installation rates. However, this does not eliminate the need for future studies on measure retention rates.

Table 6-15: Fraction of PG&E Database Measures in the Sample Provided to On-Site Survey

Area	Fraction of Measures Installed	Measure Type							
		Appliance	HVAC	Indoor Lighting	Insulation	Lighting Control	Outdoor Lighting	Water	Window
Apartments Only	0.62	0.58	0.48	0.50	0.64		0.59	0.09	0.58
Both Apartments and Common Areas	0.43		1.00	0.60		0.75	0.69	1.00	0.02
Common Areas Only	0.88	0.00	0.61	0.96	1.00	0.52	0.59	0.50	0.00
Mobile Homes	1.00		1.00						

Table 6-16: Fraction of SCE Database Measures in the Sample Provided to On-Site Survey

Area	Fraction of Measures Installed	Measure Type							
		Appliance	HVAC	Indoor Lighting	Insulation	Lighting Control	Outdoor Lighting	Water	Window
Apartments Only	0.47		0.64	0.47			0.47		
Both Apartments and Common Areas	1.00		1.00	1.00		1.00	1.00		
Common Areas Only	1.00						1.00		

Table 6-17: Fraction of SCG Database Measures in the Sample Provided to On-Site Survey

Area	Fraction of Measures Installed	Measure Type							
		Appliance	HVAC	Indoor Lighting	Insulation	Lighting Control	Outdoor Lighting	Water	Window
Apartments Only	0.32	0.24	0.10		0.32			0.01	
Both Apartments and Common Areas	1.00		1.00					1.00	
Common Areas Only	0.22		0.21					0.24	

Table 6-18: Fraction of SDG&E Database Measures in the Sample Provided to On-Site Survey

Area	Fraction of Measures Installed	Measure Type							
		Appliance	HVAC	Indoor Lighting	Insulation	Lighting Control	Outdoor Lighting	Water	Window
Apartments Only	0.14	0.00		0.14			0.00		
Common Areas Only	0.78		0.71	1.00		1.00			

6.1.2 Data Collection

The on-site data collection involved designing a survey instrument, recruiting the sample, scheduling appointments with property owners or representatives, and conducting the on-site surveys. Itron designed the on-site survey instrument. ASW Engineering performed the recruiting, scheduling, and surveying tasks.

Design Survey Instrument

The primary data collection instrument was designed to gather the following information:

- HVAC manufacturer, model number, efficiency rating, and other information contained on each equipment specification plate,
- Water heating and clothes washer manufacturer, model number, efficiency rating, and other information contained on each equipment specification plate,
- Lighting still functioning, plus verification of the installation of hard-wired fluorescent fixtures, and

- Windows still in place and window surface areas.

The primary on-site data collection instrument is in Appendix B.

As part of these verifications, limited information was recorded regarding measure usage. This information can aid in any efforts to review parameter assumptions for the energy savings estimates.

Itron entered the results of the on-site verifications into a database and applied expansion weights to estimate the universe of installed measures under the multifamily program.

Sample Recruitment

A recruiting protocol was developed. The protocol included a telephone recruiting script and a procedure for making phone calls. The recruiting script is in Appendix C.

Appointment Scheduling

When the ASW surveyor called to schedule an appointment after the participant had been recruited, site-specific information was verified such as the address and the number of buildings treated at the complex.

Conducting On-Site Surveys

Itron provided ASW with a list of building addresses, contact names, and phone numbers. Itron also provided information, including types and quantities, of all measures to be verified at each location.

Verifications were performed at sampled multifamily locations throughout the SDG&E, SCG, SCE, and PG&E territories.

Once on site, the surveyor verified the types and quantities of measures installed based on the program participant information provided by the corresponding utility. Differences between what was recorded in the program tracking databases and what was observed during the on-site surveys were reported and an attempt was made to obtain explanations. In addition, information on the operating characteristics of the measures was obtained from the property manager.

Sub-Sampling Strategy

The number of treated apartments can vary significantly within the sample of complexes. To make the process manageable and limit the number of treated apartments inspected, a within-complex sampling strategy was developed.

- For common areas, the general rule was to verify all measures. The exception was for high-rises with common areas on each floor and the same measure(s) installed on each floor. In this instance, every other floor was inspected. The same applied for complexes with multiple buildings where each building had its own common area.

- For complexes with five or less treated apartments, all apartment units were inspected.

- For complexes with more than five apartments, a sub-sample of 30% of the treated units was inspected. The procedure for selecting the sub-sample was to first calculate the number of apartment units to inspect. To calculate the number of apartment units to be inspected, the total number of treated units in the complex was multiplied by 0.30. A minimum of five units and a maximum of 20 units were required. If 30% represented fewer than five, then the number to inspect was five. If 30% represented more than 20 units, then the number to inspect was 20.

Once the number of units to be inspected was determined, the units were randomly selected. The objective was to verify a representative distribution of all the measures installed. If the apartments were distributed throughout multiple buildings, at least one apartment from each building was inspected. If this was not possible given the sub-sampling strategy described above, then at least one unit from every other building was inspected. This same approach applied to apartments on multiple floors of a high-rise building.

ASW visited each site for no more than four hours. During that time, ASW briefly interviewed the property owner or manager and attempted to locate each product rebated.

Verification included the following steps.

- **HVAC**. The inspector verified manufacturer, model number, efficiency rating, and other information contained on each equipment specification plate. If this varied from available information from the program tracking database, the information was double-checked and a note made to that effect.

- **Water heating and clothes washers**. The inspectors followed the same procedure as HVAC.

- **Lighting**. First, inspectors verified the installation of lighting equipment based on discussions with the landlord. Then for individual units, inspectors attempted to examine each CFL in use, verified that they still functioned, and examined the installation of hard-wired fluorescent fixtures in kitchens or porches. In common areas, inspectors closely inspected at least one unit of each type to verify the manufacturer and model number as compared to the program tracking information. Lighting units of a model and type (e.g., exit signs) were then counted.

- **Windows**. Efficient windows were inspected to ensure they were installed and still in place. The surface areas were measured to compare with the program tracing information as well.

6.1.3 Analysis of On-Site Data

Onsite verifications can be designed to examine three particular quantities that directly affect the energy savings of a program. These are installation rates, premature removal rates, and measure retention rates. In all cases, the timing of these verification efforts is important. Installation rates need to be verified shortly after the measures are installed. Premature removals and first year retention rates need to be verified shortly after the conclusion of the program year. These quantities or savings factors all contribute to the calculation of first year ex ante savings.

Premature removals are typically a result of some form customer dissatisfaction and usually occur shortly after the initial installation. First year retention rates are typically a result of technical failure or accidents causing failure. However, retention rates can also include removals due to remodeling and migration from the service territory.

The onsite verifications for this program occurred approximately six months after the end of the program year. This timing has an impact on how accurately all of these factors can be quantified. To compound matters, in a great many cases during the onsite verifications, the surveyors were unable to obtain accurate information on why measures were not found. As a result, it was not possible to quantify explicitly separate values for the percent of measures not installed, the percent of measures removed, or the percent of measures that failed. Hence, the resulting analysis of the on-site verifications should be used to provide insight and guidance to program modifications that will improve first year savings and measure retention.

As a result of the sub-sampling strategy employed during the on-site verification process, Itron used two methods to calculate the percent of sample measures installed and still working.

On-Site Still-in-Place Verification Ratio

For the analysis verifying on-site measures still-in-place for specific sites, the team calculated a simple utility and measure-specific ratio. The verification ratio shows the percentage of the measure found at the sub-sampling of on-site locations. This ratio does not differentiate between installation rates, premature removal rates or measure failure rates.

The ratio was calculated as the sum of the measures verified divided by the sum of the quantity of measures sampled. The measures sampled were those listed on the applications for the sub-sampled areas. The ratio for measure verified-to-still-be-in-place was as follows:

$$Ratio_V = \frac{\sum QuantityVerified}{\sum QuantitySampled}.$$

Where *QuantityVerified* is the sum of the quantities verified to be present and operational for the sub-sample of measures surveyed at the sites and *QuantitySampled* is the sum of the quantities listed on the utilities' application forms and program tracking data for the sub-sample of the sites.

The verification ratio is the simple percentage of measures found to the number of measures rebated in the tracking database for the sampled site. The verification ratio is not intended to be

the best measure of the percentage of all installed measures still installed and working at the utility's sites. A better estimate of the percentage still installed and working is the proportion of measures in place.

Proportion of All Measures Still in Place

Another important piece of information the on-site survey collected was the estimate of the percent of *all* measures still in place and working. This quantity does not differentiate between installation rates, removal rates or measure failure rates.

To estimate this percentage, the data collected from the sub-sampling of sites needed to be adjusted to account for the total number of measures reported to be installed at that site. Sub-sampling could lead to large sites receiving inappropriate low weighting. The proportion of measures in place and working attempts to use the sub-sample verification data, in combination with information about the number of measures originally installed, to estimate the percentage of all measures still installed and working. Section 7 describes in-depth the methodology used to calculate this proportion of all measures still in place.

6.2 Results

The original sample design called for 125 surveys distributed across utilities in a manner proportionate to their program participation, incorporating the utility's previous verification process. The sites at each utility were randomly selected and ASW surveyed a sub-sample of measures at selected sites. The on-site process found non-lighting verification ratios of 40% to 100% of the claimed measures, with most at 100%. The lower ratios are associated with low quantity measures. Lighting verification ratios range from a low of 61% to a high of 100%. Of the comments the surveyors received from property managers, very few indicated that measures were not installed.

However, there were many comments indicating that CFLs were removed shortly after being installed either because the tenants were dissatisfied with the quality of light or the lamps failed shortly after being installed. As was mentioned earlier, it was not possible to separately quantify the percent of measures not installed, the percent of measures removed or the percent of measures that failed.

6.2.1 Final On-Site Survey Distribution

ASW completed 126 on-site surveys. The final distribution of the sites is presented in Table 6-19. Distribution among the utilities was consistent with the original sample design. The final complex distribution differed very little from the original sample design.

The on-site surveys discovered three installations that did not conform to a strict multifamily definition. In PG&E's program, room air conditioners were installed in a hotel associated with a mobile home park. In SCG's program, two single-family homes received energy efficient measures. However, no disallowances were made for these sites.

Table 6-19: Completed On-Site Verifications

Utility	Complex Description					Total Sample Size
	Only Apartments Treated	Only Common Areas Treated	Apartments and Common Areas Treated	Mobile Home Complex	Other	
PG&E	26	13	1	1	1 Hotel	42
SCE	50	3	3	0	0	56
SCG	1	11	3	0	2 SF	17
SDG&E	6	5	0	0	0	11
					Total	126

6.2.2 Electric Measures

Table 6-20 lists the percentage of the sub-sample of on-site electric measures verified. The numbers in parenthesis are the total numbers of measures listed on the application forms for the sub-sampling of the sites. Multiplying the percentage verified by the total number of measures shows the number of measures found.

Lighting Verification Ratios

SCE's program installed 121,218 CFL bulbs and 18,652 fixtures, PG&E installed 18,478 bulbs and 15,259 fixtures, and SDG&E installed 16,538 fixtures.

Unfortunately, early on-site visits and telephone surveys of property managers uncovered potential quality control issues with lighting measures. During the on-site verification, property managers were asked if they had experienced problems with hard-wired fixtures or lamps. If they had experienced problems, they were asked to explain their experiences. Fortunately, the comments received from property managers and landlords did not indicate that there was a significant problem with measures not being installed at all. However, this issue should be given greater focus in future years so as to estimate the installation rate separate from the retention of measures. SDG&E has indicated that their on-site inspections have revealed that lighting measure installation rates are over estimated on applications by a factor of 10% to 15%.

During the on-site surveys in PG&E's territory, all of the property managers reported problems with 16- and 25-watt screw-in CFLs. Fifty percent of the surveyed property managers in SCE's territory reported problems with 13-watt screw-in CFLs. There was a much lower rate of reported problems with hard-wired fixtures than with screw-in CFLs. Problems with hard-wired fixtures were reported by 46% of property managers during on-site surveys in SDG&E's territory, 29% of property managers in PG&E's service territory, and 19% of property managers in SCE's service territory.

The responses to on-site queries about the types of lighting problems experienced indicated a high incidence of premature lamp burnout. There appears to be widespread dissatisfaction with

the amount of light emitted by low-wattage CFL lamps. There also appeared to be quality problems with both CFLs and hard-wired fixtures installed by contractors. Due to the large numbers of bulbs and fixtures installed along with high rates of dissatisfaction, the analysis of on-site verification ratios and the discussion of energy savings in Section 7 will focus closely on lighting measures.

Table 6-20 shows that the verification process found a significant number of claimed screw-in CFLs no longer in use. During the on-site survey process, ASW reported there were a number of cases where the managers indicated that the screw in CFLs had burned out and been replaced with other lights in the same class. While replacement with other CFLs does not adversely affect savings estimates in the near term, these recurring premature failures do create potential for reverting to incandescent lighting.

The on-site verification process found that in SCE's territory, 61% of 13-watt, 73% of 16-watt, and 99% of 20-watt screw-in CFLs surveyed were still in use. In PG&E's service territory, 100% of the 13-watt, 74% of the 16-watt, and 100% of the 25-watt CFLs surveyed were still in use. The low rate of on-site verification for SCE's 13-watt screw-in CFLs is similar to findings from the telephone survey, in which managers expressed a high degree of dissatisfaction with low wattage bulbs.

As shown in Table 6-20, there was a much higher verification ratio among hard-wired CFL fixtures. The on-site process verified 96% of outdoor hard-wired fixtures and 91% of indoor fixtures still in place and working in PG&E's territory, 94% of outdoor fixtures and 70% of indoor fixtures still in place and working in SCE's service territory, and 99% of indoor fixtures still in place and working in SDG&E's territory. The higher verification ratio for hard-wired fixtures, when compared with screw-in lamps, is consistent with the managers' comments concerning problems with fixtures versus lamps. In SCE's case, however, follow up investigation by the program manager found that one very large installation had removed the CFLs as a result of a renovation project that replaced 4-lamp vanities with linear fluorescents fixtures. In addition, several landlords complained about the lower wattage lamps not emitting enough light.

Table 6-20: Verified-to-Still-Be-in-Place Electric Measures

Measure Description	Verification Ratios			
	PG&E (listed)	SCE (listed)	SCG (listed)	SDG&E (listed)
CFL – 13 watt	100% (55)	61% (95)		
CFL – 16 watt	74% (144)	73% (202)		
CFL – 20 watt		99% (216)		
CFL – 25 watt	100% (155)			
Outdoor Hard-wired Fixture – 13 watt CFL	96% (278)	94% (446)		
Indoor Hard-wired Fixture – 27 watt CFL	91% (141)	70% (160)		99% (69)
LED Exit Sign	100% (19)			
Programmable Thermostat		96% (24)	100% (3)	
Occupancy Sensors	40% (5)	60% (5)		
Photocells		87% (15)		
Low-Flow Showerhead			89% (18)	
High Performance Window	100% (1,368 sf)			
Attic Insulation	100% (17,160 sf)		100% (8,108 sf)	
Wall Insulation			100% (1,400 sf)	
ENERGY STAR Room AC	100% (18)			
Split System AC – Tier 1		100% (10)		
Packaged System AC – Tier 1		100% (2)		
ENERGY STAR Dishwasher	100% (3)			

The on-site surveyors encountered issues with lighting measures that had not been anticipated during the planning of this assessment. As a result, inadequate resources were available to assess the specifics of the retention problems. Such an effort was well outside the scope of the current study. However, some information was collected that sheds light onto the issues.

When lighting measures were being verified, the following question was asked:

> *"There have been several reported problems with the hardwired fixtures and lamps. Have you experienced any problems? Yes / No If yes, please describe."*

Table 6-21 shows the results of this question. The first row shows the percentage of those sites surveyed that had missing lighting measures. The second row shows of those sites with missing lighting measures what percentage responded to the above question. The third row shows what percentage indicated that they had not experienced any problems with the lighting measures. The forth row shows what percentage reported premature failures and the fifth row shows what percentage indicated some other problem (e.g., vandalism) or they didn't give any specifics of the problem.

Table 6-21: Disposition of Lighting Measures

Disposition	PG&E (%)	SCE (%)	SDG&E (%)
Sites Missing Lighting Measures[12] of those with Lighting Measures Installed	23.8 (5/21)	51.1 (24/47)	16.7 (1/6)
Responded to Lighting Question	80.0	87.5	100
No Reported Problem w/ Lighting	25.0	81.0	100
Reported Failure (e.g., burnout)	75.0	9.5	0.0
Reported Other or No Specifics	0.0	9.5	0.0

These results indicate that there may have been a problem with measures not being installed, premature removals, or both. The number of sites with missing measures reporting that there had not been any problems with the lighting measures is very high. This can clearly lead one to believe that either the measures were never installed or they were removed prematurely. The onsite surveys did not uncover which of these two issues was responsible for the significant number of lighting measures not found. SDG&E's inspection record indicates that the percent claimed but not installed is generally in the neighborhood of 10% to 15%. If this is the case, then SCE has experienced a significant degree of premature removals. This combined with the verification ratios presented in Table 6-20 suggests that a significant number of lower wattage CFLs have been removed prematurely.

What is not apparent from Table 6-21 is that at some surveyed sites, all the lighting measures were found but the landlord still reported that there had been burnouts. In these instances, the lamps had been replaced either by the original contractor or by the property management staff. Members of the project management team corroborated this. At least one installation contractor indicated that they had received a defective batch of CFLs that failed prematurely and that they had gone back and replaced the lamps.

In future EM&V studies, the lighting retention and product quality issues uncovered in this assessment need to be addressed.

For now, some anecdotal information may shed some additional light on the issues encountered. Some feedback provided by ASW of surveyed sites is provided below.

The following lists some of the SCE surveyed sites where the manager provided comments to ASW's questions concerning problems with lighting.

[12] Hardwired fixtures and lamps.

- The manager or tenants removed all lights (CFLs). The manager stated that the lights burned out and were replaced with incandescents.

- The manager reported that many of the lights burned out. The 13-watt screw-in CFL lights were replaced with lights of the same type. The on-site surveyors actually found more CFLs in the apartments they surveyed than was listed on the application.

- The manager reported that some of the 13-watt screw-in CFL lights burned out. The tenant replaced the burned-out lights with incandescents.

- The manager reported there were problems with the 16-watt screw-in fluorescent bulbs, some of which were replaced with alternative fluorescent bulbs by the manager. The on-site surveyors only found 27 of the 54 bulbs listed on an application that should have been in the apartments surveyed.

The following lists some of the PG&E surveyed sites where the manager provided comments to ASW's questions concerning problems with lighting.

- The on-site sample of the application included 24 CFL fixtures and all were verified. The manager at the site, however, stated that the lamps burned out too soon and the original contractor replaced them with the same type of lamp.

- The on-site sample included 25 fixtures. The manager stated the lamps burned out after two to three months and that the original contractor replaced them with lamps of the same type. The on-site surveyors found only 56% of the sample fixtures.

- The on-site sample included 144 screw-in CFL lamps. The on-site surveyors found only 74% of the sampled lamps. The manager stated the lamps were removed and did not give a reason for their removal. The lamps found were not the same wattage as the lamps on the application. The application stated that the lamps should have been 16-watt CFLs. The on-site lamps were 25-watt CFLs.

- The site had both occupancy sensors and CFL screw-in lamps installed. Only two of 16 sensors were installed. The outdoor 25-watt CFL screw-in lamps had moisture problems and the original contractor replaced them with a bulb of the same type.

The following lists some of the SDG&E surveyed sites where the manager provided comments to ASW's questions concerning problems with lighting.

- This site installed 37 CFL fixtures. The on-site sample of the application included six CFL fixtures, all of which were verified. The manager at the site, however, stated that the lamps burned out too soon and that the original contractor replaced them with the same type of lamp. The fixture installed was a Technical Consumer Product with a 30-watt Circline lamp.

- The site's application states that 69 CFL fixtures were installed. The on-site sample included 17 fixtures. The on-site surveyors found 100% of the sampled fixtures. The manager stated that the lamps burned out too soon and were replaced with lamps of the same type by the original contractor and the property staff. The fixtures were installed with a 30-watt CFL.

Other Electric Verified-to-Still-Be-in-Place Measure Verification Ratios

The on-site surveys found a very high verification ratio among all other electric measures. During the on-site verification process, 100% of room air conditioners, packaged and split system air conditioners, dishwashers, insulation, windows were found. This is shown in Table 6-20.

6.2.3 Gas Measures

As shown in Table 6-22, the verification process found nearly all of the sampled gas measures. One hundred percent of gas measures, other than natural gas boiler and/or water controllers, were found. For PG&E's natural gas boilers, 15 out of 17 sampled natural gas boiler/water controllers were found to be installed and operating.

Table 6-22: Verified Gas Measures

Measure Description	Verification Ratio			
	PG&E (listed)	SCE (listed))	SCG (listed)	SDG&E (listed)
Furnace – 90 AFUE			100% (1)	
Central System NG Boiler	100% (1)		100% (7)	
Central System NG Boiler & Water			100% (24)	100% (5)
Central System NG Water Heater			100% (6)	
NG Boiler/Water Heater Controller	88% (17)			100% (7)

6.2.4 Other Observations from On-Site Data

The on-site survey also intended to collect data for the hours of operation for lighting measures, the make and model number of HVAC measures, the square footage of conditioned space for HVAC measures, and whether the complex was master metered. It is to be noted that many of the types of measures were not frequently rebated and only a small number were observed in the sample of on-sites. Therefore, the data on these measures should be viewed in the light of the small sample limitations. In addition, some of this information, such as hours of operation, is self-reported by the property managers.

The lighting hours of operation questions were asked of property managers if the lighting measures were installed in common areas and of tenants if the lights were in apartments. Often, property managers could not answer the common area hours of operation questions. When property managers did provide hours of operation, they frequently seemed unsure about the lighting application (indoor common area, outdoor common area, etc.). Several on-site surveys of screw-in CFL bulbs and fixtures installed in apartments occurred in vacant units, making it impossible to determine typical hours of operation. The collection of lighting hours of use information for the multifamily sector should be considered in future statewide EM&V studies, such as DEER updates.

On-site surveys from PG&E's service territory contained limited information on the hours of operation. Much of these data appear to be too low given the measures in question. For PG&E, 206 locations were examined for outdoor hard-wired fixtures. Of these locations, 144 provided no hours of usage information, 40 locations stated that the fixtures operated for 30 hours per month, and 21 locations stated that the fixtures operated for 60 hours per month. More realistic hours of operation were received during only one on-site survey with 10 locations for screw-in CFL bulbs in the common area. These 10 locations had hours of operation of 345 hours per month (approximately 11.5 hours per day) for each bulb. On-site data for the hours of operation from other service territories are even more limited than the data from PG&E.

Better information was obtained about the make and model of HVAC equipment. Surveyors could often obtain these data themselves directly during the on-site inspections. If the equipment was installed in an inaccessible location, such as an individual apartment or crawl space, the data may also be missing or of poor quality.

In PG&E's service territory, 18 ENERGY STAR room air conditioners were surveyed. Seventeen boiler or hot water heater controllers were also surveyed, but no make and model numbers were obtained.

In SCE's service territory, 24 programmable thermostats were surveyed. Ten split system air conditioning units were surveyed in SCE's service territory. One was a Rheem RAMB 036-JAZ, one was a Trane 1200, and eight were Weather King 12AJA3001s—all qualified units.

In SCG's service territory, seven boilers were surveyed. Data collected during the on-site surveys found that all seven boilers were Raypak qualifying units. In SCG's territory, six central system natural gas water heaters were surveyed. AO Smith and American made two of the systems. Both of these models had a listed thermal efficiency rating of at least 80% at the manufacturer's website, slightly below the required 82% efficiency requirement. During SCG's application inspection process, both of these applications were required to present equipment specification documents as proof that the water heaters met or exceeded program requirements, which they did. This was not apparent from any of the information found in the tracking database and was obtained from the program manager only after noticing that the boilers appeared not to qualify for a rebate.

In SDG&E's territory, five boilers were surveyed. No information was obtained that would disqualify them.

7. SAVINGS ASSESSMENT

7.1 Overview

In this task, the assumptions and calculations used in the *ex post* saving analysis (e.g., net-to-gross, estimated useful life, per unit energy savings, hours of operation) by each utility and filed with the California Public Utility Commission (CPUC) are validated. The *ex post* savings have not been adjusted for the proportion of measures in place a) because the data collected does not accurately quantify first year savings and b) because based on discussions with the Project Management team it was agreed that this section would not attempt to adjust the first year savings.

The original evaluation work plan called for a comparison of assumptions used in the *ex post* savings calculations to those in the Database for Energy Efficient Resources (DEER). However, the DEER estimates for multifamily buildings are currently under review and a revised database is not anticipated until spring 2004. Instead, a comparison has been carried out between utilities and the Program Work Papers supplied to the evaluation contractor. This is warranted given the differences in assumptions across the utilities for this statewide program.

The remainder of this section defines study methods, summarizes results of the evaluation, and discusses a set of evaluation issues.

7.2 Methodology

This part of the MFRP evaluation involves the following:

- Validation of first year *ex post* savings calculations,
- Assessment of first year savings, and
- A comparison of savings parameters used to develop ex ante energy savings estimates.

The methodology used in these three analyses is discussed below.

7.2.1 Validation of Savings Calculations

Validation of savings calculations are performed for both the first year and the lifetime energy savings calculations. To validate the first year savings calculations filed by each utility, the team matched the utility's program database to their filings. First, the number of measures reported as paid and committed was validated against the program databases. These quantities were then multiplied by the number of measures installed, the net-to-gross ratios, and the claimed energy savings. During this validation process, the team accepted the utility's specified net-to-gross ratios, per-unit annual energy savings, net-to-gross ratios, and the treatment in their database and filings of committed, paid, and cancelled rebate applications.

7.2.2 Assessment of First Year Savings

In consultation with the project management team, it was determined that this assessment would not make adjustments to the first year savings estimates nor would it recommend changes to the program's effective useful life estimates for any of the measures. The program had experience some unusual and very likely one-time problems with lighting measures. It would be inappropriate to make adjustments to these savings factors given the strong belief that these problems were one-time occurrences. The problems encountered are not believed to be indicative of a long running statewide program.

Instead of calculating an adjusted first year energy savings, an indicator of the success within the first year has been developed, the proportion of measures in place.

Proportion of Measures in Place

To determine the proportion of measures in place, the verification ratio was adjusted so that sites with fewer measures installed received a smaller weight than sites with a large number of measures installed. Calculating the proportion of measures in place was a three-step process. The first step calculated a ratio for the sub-sample of measures surveyed at each site:

$$Ratio_{site} = \frac{QuantityFound}{QuantityListed}.$$

Each site ratio was then multiplied by the quantity of the measure listed on the site's application form. This process determined the team's best estimate of the number of the measure still working at the surveyed site. The final step summed the number of the measure still working and divided it by the number of the measure listed on the applications for the surveyed sites:

$$ProportionOfMeasureInPlace = \frac{\sum_{SurviedSites} Ratio_{site} * QuantityListedSite}{\sum_{SurviedSites} QuantityListedSite}.$$

If, during the on-site verification process, a measure was not surveyed for a particular utility, the proportion of measures in place was set to one. Setting the proportion to 1.0 implicitly assumes that all measures are still working, a 100% verification rate. Since most lighting measures were represented during the on-site survey process, this assumption was largely applied to non-lighting measures that were not surveyed. The on-site analysis of non-lighting measures found that nearly 100% were verified (see Table 6-20 and Table 6-22).

Comparison of Savings Parameters

To further evaluate the first year savings estimates for the MFRP, Itron compared the following parameters provided by the utilities:

- Number of measures installed,
- Gross per-unit energy savings,
- Net-to-gross ratio, and

- Expected useful life.

Given the information in the different utility databases and their filings with the CPUC, each utility in the program appears to specify these values differently. The different specifications affect the calculation of first year savings, the adjustment to first year savings, and the calculation of lifetime savings. These parameter values were compared across utilities and the differences are highlighted. A detailed description of the findings is presented later in this section.

7.3 Results

This section discusses the results of the validation of first year savings calculation, adjustment of first year savings, and the comparison of savings parameters.

7.2.3 Validation of Savings Calculation Results

The team validated the first year savings calculations, which were accurate. To determine the first year energy savings as calculated using the program databases supplied, the team first needed to determine the number of units per measure. The applications in the utility-provided databases contained applications that were paid, committed, and cancelled. SDG&E's and SCG's databases indicated which applications were cancelled. These applications were deleted from the analysis before determining the total number of units per measure. SCE's program database included applications that may have been cancelled. Given the database variables provided to Itron, it was not possible to identify them. Three of these were included in the on-site survey sample and were confirmed as such by SCE.

To determine a measure's total energy savings for a utility, the number of units was multiplied by the yearly gross energy savings per unit and the measure's net-to-gross ratio. The utility's total net energy savings from the database is the sum of the utility measure's net energy savings. The database numbers were compared with the filed numbers for each utility. The filed net energy savings for SDG&E, PG&E, and SCG include committed and paid applications. The filed net energy savings for SCE include committed, paid, and cancelled applications.

Table 7-1 presents the numbers calculated using the program databases provided to Itron. In most cases, the numbers exactly match those filed with the CPUC. For example, SCG's net therm filings are 283,827 therms, exactly the quantity calculated using SCG's database. Occasionally, the filed numbers and the database numbers are insignificantly different. For example, PG&E's net kWh fillings with the CPUC are 2,480,437 kWh. Their CPUC filings are slightly higher than the database first year savings of 2,480,340 kWh. The differences in these numbers are likely due to rounding differences in the yearly kWh savings per unit.

Table 7-1: Gross and Net Energy Savings

Measures	Utility	Gross	Net
		Filed Energy Savings	Filed Energy Savings
Lighting	All Utilities	10,577,445	8,814,121
	PG&E	2,439,382	2,171,050
	SCE	6,664,501	5,331,601
	SDG&E	1,473,562	1,311,470
Other Electric	All Utilities	465,510	413,938
	PG&E	347,517	309,290
	SCE	104,194	92,367
	SDG&E	13,799	12,281
Total Electric	All Utilities	11,042,955	9,228,059
	PG&E	2,786,899	2,480,340
	SCE	6,768,695	5,423,968
	SDG&E	1,487,361	1,323,751
Total Gas	All Utilities	581,411	517,456
	PG&E	78,932	70,250
	SCG	318,907	283,827
	SDG&E	183,572	163,379

PG&E = Pacific Gas & Electric
SCE = Southern California Edison
SCG = Southern California Gas Company
SDG&E = San Diego Gas & Electric

7.2.4 Assessment of First Year Energy Savings

Table 7-2 and Table 7-3 show the proportion of measures in place for electric and gas measures, respectively. The methodology for calculating these measures is described earlier in this section. Table 7-2 shows that a high percentage of lighting measures are no longer in place. For the non-lighting electric measures, nearly 100% of the measures are found to be working and in place.

In general, the proportion of measures in place does not differ dramatically from the verification ratios listed in Table 6-20 and Table 6-22. If the verification ratio was 1.00 or 100%, the proportion of measures in place is also 100%.

For PG&E and SDG&E, the lighting verification ratios reported in Section 6 differ little from the proportion measures presented in Table 7-2. The verification ratio for PG&E's indoor hard-wired fixtures was 91% during the sub-sampling of surveyed sites. Weighting each site-specific verification ratio by the total number of measures installed at each site increases the proportion to 94%. For SDG&E's hard-wired fixtures, the verification ratio and the proportion of measures in place are both 99%.

The proportion of measures in place for SCE's screw-in CFLs is lower than the utility's verification ratios. Of SCE's 13-watt screw-in CFLs, 61% were found during the sub-sampling of surveyed sites. Weighting the sites for the number of measures installed reduces the

proportion to 48%. For SCE, sites with more CFLs installed had lower verification ratios, leading to a reduction in the proportion of measures in place.

Table 7-2: 2002 Proportion of Electric Measures in Place

Measure Description	PG&E	SCE	SCG	SDG&E
CFL – 13 watt	100%	48%		
CFL – 16 watt	74%	60%		
CFL – 20 watt		99%		
CFL – 25 watt	100%			
Outdoor Hard-wired Fixture – 13 watt CFL	99%	95%		
Indoor Hard-wired Fixture – 27 watt CFL	94%	70%		99%
LED Exit Sign	100%			
Programmable Thermostat		99%	100%	
Occupancy Sensors	40%	60%		
Photocells		86%		
Low-Flow Showerhead			89%	
High Performance Window	100%			
Attic Insulation	100%		100%	
Wall Insulation			100%	
ENERGY STAR Room AC	100%			
Split System AC – Tier 1		100%		
Packaged System AC – Tier 1		100%		
ENERGY STAR Dishwasher	100%			

Table 7-3 shows the proportion of gas measures in place. In general, these ratios are the same as the verification ratios presented in Section 7. Nearly all gas measures are 100% in place and working.

Table 7-3: 2002 Proportion of Gas Measures in Place

Measure Description	PG&E	SCE	SCG	SDG&E
Furnace – 90 AFUE			100%	
Central System NG Boiler	100%		100%	
Central Sys. NG Boiler & Water			100%	100%
Central Sys. NG Water Heater			100%	
NG Boiler/Water Controller	88%			100%
Programmable Thermostat		99%	100%	
Low-Flow Showerhead			89%	
High Performance Window	100%			
Attic Insulation	100%		100%	
Wall Insulation			100%	
ENERGY STAR Dishwasher	100%			

7.2.5 Comparison of Savings Parameters Results

This section discusses and compares each parameter used by each utility in calculating estimates of savings.

Number of Measures Installed

Table 7-4 and Table 7-5 list the number of electric and gas measures installed. The listed measures contribute both gas and electricity savings. PG&E has the widest range of measures listed, SCG has more water heaters and boilers than the other utilities, and SCE installed more lighting measures.

SCE's large number of screw-in CFL bulbs, combined with its proportion of measures in place, will lead to a significant reduction in its adjusted first year energy savings. SCE's program installed 121,218 CFL bulbs and 18,652 fixtures. SCE installed significantly more lighting measures than either PG&E or SDG&E, and SCE installed a higher percentage of bulbs relative to fixtures than the other two utilities. Approximately 86% of SCE's CFL lighting measures are screw-in bulbs, while only 55% of PG&E's and none of SDG&E's CFL lighting measures are screw-in bulbs.

Table 7-4: 2002 Quantity of Electric Measures Installed

Measure Description	PG&E	SCE	SCG	SDG&E
CFL – 13 watt	11,062	17,280		
CFL – 16 watt	3,213	83,028		
CFL – 20 watt	3,404	20,910		
CFL – 25 watt	799			
Outdoor Hard-wired Fixture – 13 watt CFL	2,748	7,730		80
Indoor Hard-wired Fixture – 27 watt CFL	12,511	10,922		16,458
LED Exit Sign	665	3		42
Programmable Thermostat	17	180	17	
Occupancy Sensors	99	5		5
Photocells	208	23		
Low-Flow Showerhead	19		132	
Faucet Aerator	16			
High Performance Window	30,789 ft^2			
Attic Insulation	126,124 ft^2		34,758 ft^2	
Wall Insulation	40,884 ft^2		3,171 ft^2	
ENERGY STAR Room Air Conditioner	68	32		
Split System Air Conditioner – Tier 1	2	118		
Packaged System Air Conditioner – Tier 1	22	5		
ENERGY STAR Dishwasher	74		41	2
ENERGY STAR Clothes Washer	32		1	

Table 7-5: 2002 Quantity of Gas Measures Installed

Measure Description	PG&E	SCE	SCG	SDG&E
Furnace – 80 AFUE	2		1	
Furnace – 90 AFUE	6		1	
Central System NG Boiler	8		22	
Central Sys. NG Boiler & Water			271	6
Central Sys. NG Water Heater	8		46	
Storage Sys. NG Water Heater	32		241	
NG Boiler/Water Controller	31			
NG Boiler Controller			35	37
NG Water Heater Controller			22	105
Programmable Thermostat	17	180	8	
Low-Flow Showerhead	19		132	
Faucet Aerator	16			
High Performance Window	30,789 ft^2			
Attic Insulation	126,124 ft^2		34,758 ft^2	
Wall Insulation	40,884 ft^2		3,171 ft^2	
ENERGY STAR Dishwasher	74		41	2
ENERGY STAR Clothes Washer	32		1	

The quantities of units are comprised of two components: (1) paid, and (2) committed. The paid quantities are those that were applied for, verified, and incentivized by December 31, 2002. The committed quantities are those that have been applied for and rebate funds committed to, but had not yet been paid by December 31, 2002. The treatment of committed units is different across the utilities. Eventually, most committed quantities are rebated but some are not. SDG&E, SCG, and PG&E do not include those classified as committed but not paid (within a prescribed period). SCE does include these units in their savings calculations. There is no clear definition from the CPUC on how to declare these committed units. Including units committed at the end of the year but never rebated can overstate the savings estimate.

Gross Per-Unit Energy Savings

The next factor examined is the gross per-unit energy savings for each measure. Table 7-6 and Table 7-7 list the gross per-unit annual kWh and therm savings for PG&E, SCE, and SCG. Table 7-6 also lists the per-unit yearly gross kWh savings for SCE's non-lighting measures only. Table 7-8 lists SCE's per unit yearly gross kWh savings for screw-in CFL bulbs and fixtures. SCE's lighting savings are listed separately because they list their measures and claim their savings significantly differently than the other utilities.

Table 7-6 shows that the utilities claim the same per unit savings for hard-wired fixtures, exit signs, occupancy sensors, photocells, Energy Star room air conditioners, and Energy Star

dishwashers. For these measures, the utilities followed the per unit energy savings listed in the MFRP PY2002 workbook. The workbook lists the assumed hours of usage, the incremental measure cost, the net-to-gross ratio, and the energy savings per year for each measure.

Table 7-6: 2002 Gross Per-Unit Electric Savings

Measure Description	PG&E (kWh)	SCE (kWh)	SCG (kWh)	SDG&E (kWh)
CFL – 13 watt	47.27	(see Table 7-8)		
CFL – 16 watt	57.58	(see Table 7-8)		
CFL – 20 watt	70.26	(see Table 7-8)		
CFL – 25 watt	95.81	(see Table 7-8)		
Outdoor Hard-wired Fixture – 13 watt CFL	110.00	(see Table 7-8)		110.00
Indoor Hard-wired Fixture – 27 watt CFL	89.00	(see Table 7-8)		89.00
LED Exit Sign	315.00	315.00		315.00
Programmable Thermostat	247.58	293.39	480.45	
Occupancy Sensors	93.00	93.00		93.00
Photocells	106.00	106.00		
Low-Flow Showerhead	22.70		0	
Faucet Aerator	8.85			
High Performance Window	1.98/sf			
Attic Insulation	0.13/sf		0.19/sf	
Wall Insulation	0.13/sf		0.075/sf	
ENERGY STAR Room Air Conditioner	127.00	127.00		
Split System Air Conditioner – Tier 1	232.00	351.63		
Packaged System Air Conditioner – Tier 1	232.00	395.88		
ENERGY STAR Dishwasher	52.00		52.00	52.00
ENERGY STAR Clothes Washer	40.00			

The utilities claim different energy savings per unit for gas and electric measures not listed in the MFRP workbook. In general, the measures covered by the program but not listed in the workbook are weather sensitive measures: programmable thermostats, attic and wall insulation, air conditioners, and furnaces. The gross yearly savings claimed by the utilities for these measures are constant for a given utility, but differ across utilities. There is no evidence in the utility databases to suggest that the claimed per unit energy savings are directly related to the climate zone were the measures were installed.

Table 7-7: 2002 Gross Per-Unit Gas Savings

Gas Measure Description	PG&E (Therms)	SCE (Therms)	SCG (Therms)	SDG&E (Therms)
Furnace – 80 AFUE	22.25		5.25	
Furnace – 90 AFUE	47.00		16.67	
Central System NG Boiler	1900.00		1900.00	
Central Sys. NG Boiler & Water			750.00	750.00
Central Sys. NG Water Heater	257.00		257.00	
Storage Sys. NG Water Heater	14.00		11.00	
NG Boiler/Water Controller	1388.00			
NG Boiler Controller			900.00	900.00
NG Water Heater Controller			900.00	1388.00
Programmable Thermostat	67.50		47.03	
Low-Flow Showerhead	6.80		9.00	
Faucet Aerator	2.55			
High Performance Window	0.20/ft^2			
Attic Insulation	0.05/ft^2		0.16/ft^2	
Wall Insulation	0.05/ft^2		0.08/ft^2	
ENERGY STAR Dishwasher	16.00		16.00	16.00
ENERGY STAR Clothes Washer	27.00		27	

Table 7-8 lists the gross per unit savings claimed by SCE for screw-in CFL bulbs and fixtures. SCE separated their fixtures and bulbs into indoor and outdoor lights. SCE assumes 3.5 hours of usage per day for indoor screw-in CFL and 8.2 hours for outdoor CFLs. PG&E, the only other utility with both bulbs and fixtures, claims the same hours of usage (3.5 hours) and the same per unit energy savings for indoor and outdoor screw-in CFLs.

The MFRP PY2002 work papers provide the hours-per-day assumptions and a list of ENERGY STAR accepted equivalent replacement CFL wattages for CFL fixtures. The work papers explicitly separate indoor and outdoor fixtures, giving them different hours of usage and energy savings per year. The work papers do not separate indoor and outdoor screw-in bulbs. The work papers present several examples to help utilities calculate their per year energy savings for screw-in CFLs, always assuming 3.5 hours per day. The work papers never explicitly state that all screw-in CFLs be treated as indoor lighting. Examination of the utility databases for claimed energy savings indicates that PG&E treated all screw-in CFLs as indoor lighting, while SCE separated screw-in CFLs into indoor and outdoor lighting.

Table 7-8 shows the quantity of each type of lighting, broken down by wattage, gross yearly kWh per light, and measure description from Table 7-2. The utilities used the measure description from Table 7-2 to classify the lights. This description will be used to determine the percentage of bulbs and fixtures in place during the first year savings analysis.

As shown in Table 7-8, SCE separated their screw-in CFL bulbs into finer wattage categories than PG&E, the only other utility with screw-ins. PG&E used the measure description categories from Table 7-2. The measure description categories from Table 7-2 allowed PG&E to use the hours of use and the list of ENERGY STAR accepted equivalent replacement CFL wattages from the workbook. SCE chose to divide hours of use and use an alternative set of replacement CFL wattage assumptions. The replacement wattage assumptions used by SCE resulted in less claimed savings than the workbook assumptions.

Table 7-8: SCE's 2002 Lighting Quantities and Yearly Electric Savings per Unit

Measure Description	Quantity	Gross kWh per unit	Measure Description From Table 7-6
CFL – 5 to 13 watt, Exterior	2	75.000	CFL 13 watt
CFL – 9 watt, Exterior	4	47.680	CFL 13 watt
CFL – 9 watt, Interior	964	20.448	CFL 13 watt
CFL – 11 watt, Exterior	867	41.720	CFL 13 watt
CFL – 11 watt, Interior	4246	17.892	CFL 13 watt
CFL – 13 watt, Exterior	279	35.760	CFL 13 watt
CFL – 13 watt, Interior	10918	15.336	CFL 13 watt
CFL – 14 watt, Exterior	577	77.480	CFL 16 watt
CFL – 14 watt, Interior	40771	33.228	CFL 16 watt
CFL – 14 to 20 watt, Exterior	4150	149.000	CFL 16 watt
CFL – 15 watt, Exterior	2741	74.500	CFL 16 watt
CFL – 15 watt, Interior	34390	31.950	CFL 16 watt
CFL – 18 watt, Interior	4	40.896	CFL 16 watt
CFL – 20 watt, Exterior	385	119.200	CFL 16 watt
CFL – 20 watt, Exterior	359	119.200	CFL 20 watt
CFL – 20 watt, Interior	10	51.120	CFL 16 watt
CFL – 20 watt, Interior	9766	51.120	CFL 20 watt
CFL – 21 to 30 watt, Exterior	208	134.000	CFL 20 watt
CFL – 22 watt, Interior	4	48.564	CFL 20 watt
CFL – 23 watt, Exterior	581	110.260	CFL 20 watt
CFL – 23 watt, Interior	7290	47.286	CFL 20 watt
CFL – 24 watt, Exterior	23	107.280	CFL 20 watt
CFL – 24 watt, Interior	488	46.008	CFL 20 watt
CFL – 25 watt, Exterior	257	149.000	CFL 20 watt
CFL – 25 watt, Interior	1710	63.900	CFL 20 watt
CFL – 27 watt, Interior	220	61.344	CFL 20 watt
CFL – 30 watt, Interior	4	89.460	CFL 20 watt
Outdoor Hard-Wired Fixture – 13 to 18 watt CFL	7730	110.000	Outdoor Hard-wired Fixture – 13 watt CFL
Indoor Hard-Wired Fixture – 26 to 30 watt CFL	10922	89.000	Indoor Hard-wired Fixture – 27 watt CFL

Differences in claimed per-unit energy savings fall into two groups: lighting hours of usage and weather sensitive measures not listed in the program workbook. SCE claimed indoor and

outdoor hours of usage for their screw-in CFL bulbs, while PG&E used the lower indoor hours for all bulbs. The workbook does not explicitly state that only indoor hours were to be used, though all screw-in bulb examples use indoor hours of usage. The workbook explicitly lists indoor and outdoor examples for CFL fixtures. Given the significant difference in the assumed hours of usage, 3.5 hours for indoor and 8.2 hours for outdoors, it would be more accurate for all the utilities to differentiate the application of lighting measures.

The measures included in the program but not listed in the workbook are largely weather sensitive measures such as air conditioners, thermostats, furnaces, windows, and insulation. Differences in claimed energy savings may be justified based on different climate zones. This justification, however, is somewhat tempered by the fact that while there are differences across utilities, the claimed energy savings are constant within a utility service territory. The utilities may be basing their claimed energy savings on an average climate zone for their service territory, rather than on the climate zone of the specific installation.

Net-To-Gross Ratio

According to the CPUC's Energy Efficiency Policy Manual dated November 29, 2001, all measures installed in residential programs should use a net-to-gross ratio of 0.89. This ratio comes from Table 4.2, page 23 of the CPUC Manual. In addition, the program workbook prescribes a net-to-gross value of 0.89 for all measures. PG&E, SDG&E, and SCG use 0.89 as their net-to-gross ratio for all measures installed in the 2002 MFRP. SCE uses a net-to-gross ratio of 0.80 for all measures other than ENERGY STAR split-system air conditioners, ENERGY STAR programmable thermostats, high efficiency exit signs, occupancy sensors, and photocells. For these listed measures, SCE used a net-to-gross ratio of 0.89. Using a lower net-to-gross ratio reduces their filed and adjusted first year kWh savings and their lifetime kWh savings calculation.

Effective Useful Life

The utilities have largely followed the workbook on the effective useful life (EUL) of electric measures, but have chosen to differ with the workbook on several gas measures. Measures not listed in the workbook but covered by the program do not have a prescribed EUL.

Most of the EUL differences for gas measures result in the utility assuming a shorter EUL than the workbook prescribes. SCG assumes that central system boilers and storage system water heaters have an EUL of four years. The workbook recommended an EUL of 20 years for these measures. SCG's assumption appears to be unusually short, significantly reducing their lifetime therm energy savings.

Table 7-9 present the EUL for electric measures. Table 7-10 lists the EUL for gas measures. The tables list EULs as provided by the MFRP PY2002 workbook and as listed in the filings provided by each utility. Measures without a workbook EUL were measures covered by the program, but not listed in the workbook.

Table 7-9: Effective Useful Life for Electric Measures

Electric Measure Description	Workbook EUL	PG&E	SCE	SDG&E
CFL - 13 watt	9	9	9	
CFL - 16 watt	9	9	9	
CFL - 20 watt	9	9	9	
CFL - 25 watt	9	9	9	
Outdoor Hard-wired Fixture - 13 watt CFL	20	20	20	20
Indoor Hard-wired Fixture - 27 watt CFL	20	20	20	20
LED Exit Sign	16	16	16	16
Programmable Thermostat		12	12	
Occupancy Sensors	8	8	8	16
Photocells	8	8	8	
Low-Flow Showerhead	10	10		
Faucet Aerator	10	10		
High Performance Window	20	20	20	20
Attic Insulation	20	20	20	
Wall Insulation	20	20	20	
ENERGY STAR Room Air Conditioner		15	15	
Split System Air Conditioner - Tier 1		18	18	
Packaged System Air Conditioner - Tier 1		18	18	
ENERGY STAR Dishwasher	13	13		13
ENERGY STAR Clothes Washer	14	14		

As shown in Table 7-9, the utilities follow the workbook's recommended EUL for nearly all electric measures. The only electric EUL that differs with the workbook's recommendations is SDG&E's 16 years for occupancy sensors—the workbook recommends eight.

Table 7-10 lists gas EULs. The utilities usually follow the workbook recommendations for gas measures, though there are more gas measure differences than for electric measures. SCG appears to have chosen unusually low EULs for boilers and water heaters. The workbook recommends a 20-year EUL for central system boilers and boiler/water combinations. SCG has chosen a four-year EUL.

Because this is a statewide program, the factors used to calculate savings across the utilities in the state should be consistent.

Table 7-10: Effective Useful Life for Gas Measures

Gas Measure Description	Workbook EUL	PG&E	SCG	SDG&E
Furnace - 80 AFUE		20	20	
Furnace - 90 AFUE		20	20	
Central System NG Boiler	20	20	4	20
Central Sys. NG Boiler & Water	20	20	4	20
Central Sys. NG Water Heater	20	20	15	
Storage Sys. NG Water Heater	13	15	4	13
NG Boiler/Water Controller	15	15	15	15
NG Boiler Controller	15	15	15	15
NG Water Heater Controller	15	15	15	15
Programmable Thermostat		12	11	
Low-Flow Showerhead	10	10	15	
Faucet Aerator	10	10	15	
High Performance Window	20	20		
Attic Insulation	20	20	20	
Wall Insulation	20	20		
ENERGY STAR Dishwasher	13	13	10	13
ENERGY STAR Clothes Washer	14	14		

8. HARD-TO-REACH (HTR) ANALYSIS

This section is divided into three subsections.

- The first discusses background information on HTR populations for energy efficiency programs in California, interpretation of the CPUC directive for the multifamily rebate program by various utilities, and goals developed by each utility for meeting the CPUC HTR directive, and overall performance against these goals during PY2002.

- The second section assesses how successful each utility has been in PY2002 multifamily rebate program in penetrating their target multifamily sector. This section uses a geographic information system (GIS) to determine who is and who is not participating. It also explores the extent to which program policy and other factors have affected the distribution of rebates across the utilities.

- The third examines the CPUC general HTR policy in light of the findings from the GIS analysis. The results have implications for the appropriateness of the current HTR policy. For instances, the results show that the targeting of rural areas in the MF program is counterproductive to the intended goals of the CPUC in developing HTR policy. In addition, based on these results, questions are raised about the wisdom of addressing HTR analysis and policy on an individual program level rather than on an overall portfolio basis.

8.1 HTR Background and Utility HTR Goals for the Multifamily Program

In 2002, the CPUC encouraged the utilities to attract participants from classes of customers who had not traditionally participated in utility-sponsored energy efficiency initiatives. The CPUC established the following categories of residential customers as being hard-to-reach (HTR):

- **Language**. Primary language spoken is other than English, and/or

- **Income**. Customers who fall into the moderate income level (income levels less than 400% but greater than 150% of federal poverty guidelines), and/or

- **Housing Type**. Multifamily and mobile home tenants, and/or

- **Geographic**. Residents of areas other than San Francisco Bay, San Diego, Los Angeles Basin, or Sacramento, and/or

- **Homeownership**. Renters

8.1.1 What Are Each Utility's HTR Goals?

Because the MFRP is targeted exclusively at the multifamily and mobile home market, nearly all participants at least meet the "Housing Type" category within the CPUC definition of HTR. The

only MFRP participants who could not be classified as HTR are the few participants living in multifamily condominiums who own those units.

The utilities emphasize in planning documents that the MFRP is attracting one of the heretofore-underserved markets. However, since the CPUC required each energy efficiency program to set a HTR target for 2002, each utility went further in establishing specific secondary goals to market to areas where multifamily buildings were likely to contain occupants within CPUC-defined moderate income and geographic HTR categories. The utilities did not want a situation where a disproportionate amount of the multi-family program benefits was flowing to the most affluent multi-family dwellers. Hence, each utility, except SDG&E, established these secondary goals to attract a percentage of multifamily participants from these other HTR categories.

To implement their HTR goals, each utility used a list of zip codes within its service territory that were categorized as rural/non-urban and/or having a higher than average percentage of households in the moderate income (between 150 % and 400% of the Federal poverty guidelines). Since a similar level of information was not available at the time of goal setting and program implementation for non-English speaker multifamily dwellers, this segment was not targeted specifically. The Statewide Residential Customer Needs Assessment Study provided the background zip code data for these designations.[13]

Much of the identification of HTR segmentation relied on a zip code mapping created in the Statewide Residential Needs Assessment Study, which classified California's zip codes by a variety of demographic and available Census data features. This study produced segment maps identifying the location of HTR population densities by zip code and utility service maps.

The HTR segments targeted by the 2002 Statewide Multifamily Rebate program are:

- **Rural**: PG&E designated rural as every city not located in the San Francisco Bay Area or Sacramento, while SCE and SCG used the Statewide Residential Needs study rural[14] zip code mapping. SDG&E did not include a rural population segment.

- **Moderate income**: SCE and SCG also included moderate-income customers in their HTR segments (PG&E and SDG&E did not). Customers in zip codes with a large percentage of moderate-income residents were classified as being of moderate income.

- **Multifamily and Mobile homes**: SDG&E included all renters in multifamily or mobile homes irrespective of income classification or geographic location as HTR.

As Table 8-1 indicates, each utility has its own criteria and 2002 goal for HTR within their territory.

[13] TecMrkt Works, CALMAC # 3533, 2000.

[14] Rural zip codes include several parts of Large Metropolitan Counties that are considered rural. A good example is the eastern desert part of San Bernardino County. See Goldsmith, H. Puskin, D., and Stiles, D.; " Improving the Operational Definition of Rural Areas for Federal Programs"; http://www.nal.usda.gov/orhp/Goldsmith.htm.

Table 8-1: Utility Hard-to-Reach Definitions and 2002 Goals

	2002 HTR Performance Goals	2002 HTR Performance Result	Criteria Used to Determine Which Zip codes Are HTR
PG&E	30%	31%	Zip codes outside Bay area nine counties and Sacramento
SCE	36%	58.5%	Rural[15] and those zip codes with 43% or more of households with household incomes between 150% and 400% of poverty level.
SCG	10%	34%	Rural[16] and those zip codes with 43% or more of households with household incomes between 150% and 400% of poverty level
SDG&E	93%	94%	All renters in multifamily units and mobile homes.

8.1.2 Did Each Utility Meet Their HTR Goals?

Most of the attention given to HTR customers in the quarterly reports focuses on the secondary goals of reaching non-urban and moderate-income multifamily households. As Table 8-1 shows, the utilities all met their secondary goals. As is discussed in more detail in the next two subsections, the achievement of these secondary goals, while laudable, certainly has less significance than the overall achievement of delivering services to the multifamily sector.

By measure of the very broadest and clearly the most important criteria, i.e. multi-family dwellings, the 2002 MFRP is an unqualified success with respect to meeting CPUC HTR policy directives. With the new program design, the MFRP has been transformed from the RCP model, which largely could not address the needs of the multifamily landlords and tenants, to a viable program effectively delivering services to this previously underserved market, which had long resisted prior conservation initiatives due to fundamental split incentive barriers.

8.2 A Geographic Analysis of HTR

8.2.1 HTR Methodology Using a Geographic Information System

A detailed analysis was made of the distribution of rebates across the four service territories. To accomplish this analysis, a geographic information system (GIS) was constructed that can merge data on the location of each participant multifamily complex with the 2000 U.S. Census data. The GIS software, ArcView 8.3, can locate the exact coordinates of more than 95% of the

[15] Rural zip codes include several parts of large metropolitan counties considered rural. A good example is the eastern desert part of San Bernardino County. See Goldsmith, H. Puskin, D., and Stiles, D., "Improving the Operational Definition of Rural Areas for Federal Programs," http://www.nal.usda.gov/orhp/Goldsmith.htm.

[16] ibid

program participants by matching street addresses to the underlying street data contained in the year 2000 TIGER data set.[17]

Once the exact location of each site is determined, the GIS assigns to that location the underlying census tract information on the housing type as well as other demographic variables that may be of interest, including the population's racial composition, median income, and housing type. The boundary of each utility service territory can also be overlayed. This results in the bisection of census tracts. All population statistics are automatically proportioned to the bisected pieces proportional to their area relative to the original land area. Because this process can produce tiny clips of census tracts, all partial tracts are dropped that contain less than 5% of the original tract area or have a total number of housing units less than 25.[18]

For each of the four utility service territories, an analysis of the rebates received is compared to the median income of the census tract, the percentage of population that is non-white and/or Latino, and the percentage living in areas defined as rural (note the in this comparison "rural" is as defined by the Census). In each case, correlation statistics are used to measure the strength of the relationship between the rebate amount per household and each of the other variables of interest.

To express rebate coverage across the service territory, the total rebate dollars are summed for each census tract and divided by the total number of households in the tract. The total number of households in each tract was used because it provides a more reliable statistic than the number of multifamily units. As we explain in more detail below, there is a discrepancy between the Census count of multifamily homes and the program's count, such that using $/multifamily unit produces some bizarre results. The $/household statistic, while not as descriptive a $/multifamily would be, still eliminates the bias that would be expected because census tracts with more housing units would also be more likely to have higher total voucher amounts. Expressing all activity on a per household basis eliminates the issue of absolute size of the tract.

The purpose of this analysis is to assess how good the coverage of the MFRP is with respect to total number of household units. This issue is addressed on three levels.

- **Where did the rebates go?** The team first looked at the actual locations where the rebates were given and used the GIS to describe the tracts based on the 2000 U.S. Census

[17] The Topologically Integrated Geographic Encoding and Referencing (TIGER) files define the location and relationship of streets, rivers, railroads, and other features to each other, and to the numerous geographic entities for which the Census Bureau tabulates data from its censuses and sample surveys. It is designed to ensure there is no duplication of these features or areas. See http://www.census.gov/geo/www/tiger/overview.html for more information.

[18] The overlay of two sets of polygonal data will result in some small clipping because of slight inaccuracies in the line segments used to outline the polygons. For example, if both sets of data have the same road as a boundary, but one set has a more accurate representation of that road, then what should be treated as the same line will appear to be two separate lines closely associated with each other, but crisscrossing each other and creating minute areas that show differences in the representation of that road. For permanent GIS systems, it would be important to redefine that road in one set to be exactly like the other so that no little polygons are created in the intersection. For the purposes of this work, dropping these little polygons does not affect the analysis and is much simpler to implement.

data. The most important finding was the low degree of coverage across each utility. Most tracts in each service territory had no activity in 2002.

- **Are there patterns with respect to race, income, and population density that account for the differences in the coverage?** The team compared the characteristics of each active tract to the characteristics of tracts with no activity. The team also looked for trends in the distribution of activity across racial composition and income and performed a correlation analysis to determine which factors were most associated with the distribution of funds across tracts. In general, no obvious signs of discrimination were found. A few statistics show areas of favoritism; however, some of that is likely because the program is not expected to serve low-income households. (A separate program existed addressing the lower income population.) Another effect is likely caused by utility efforts to steer program activity to rural areas.

- **What effects have the HTR goals had on the distribution of rebates?** One factor that may affect the distribution of rebates is the utility efforts to direct activity to certain designated HTR areas. The team looked at the relationship between the distribution of rebates per household and the distribution of multifamily households to see if more activity could be detected than would normally be expected in areas that the utilities designated as target areas. The results indicate that the utilities have been successful in moving activity to areas with higher rural populations. They have not been as successful in targeting those tracts with the most moderate-income households.

8.2.2 Where Did the Rebates Go?

The first question addressed with respect to the analysis is what does the distribution of MFRP rebates look like across the four utilities? Figure 8-1 through Figure 8-5 show the distribution of rebate dollars geographically. These maps show that only a small percentage of the area within the utility service territories have program activity. This is further illustrated in Table 8-2, where only 3.5 to 8.5% of the census tracts show any activity.

Figure 8-1: Statewide Map of Multifamily Rebate Dollars by Census Tract ($/household)

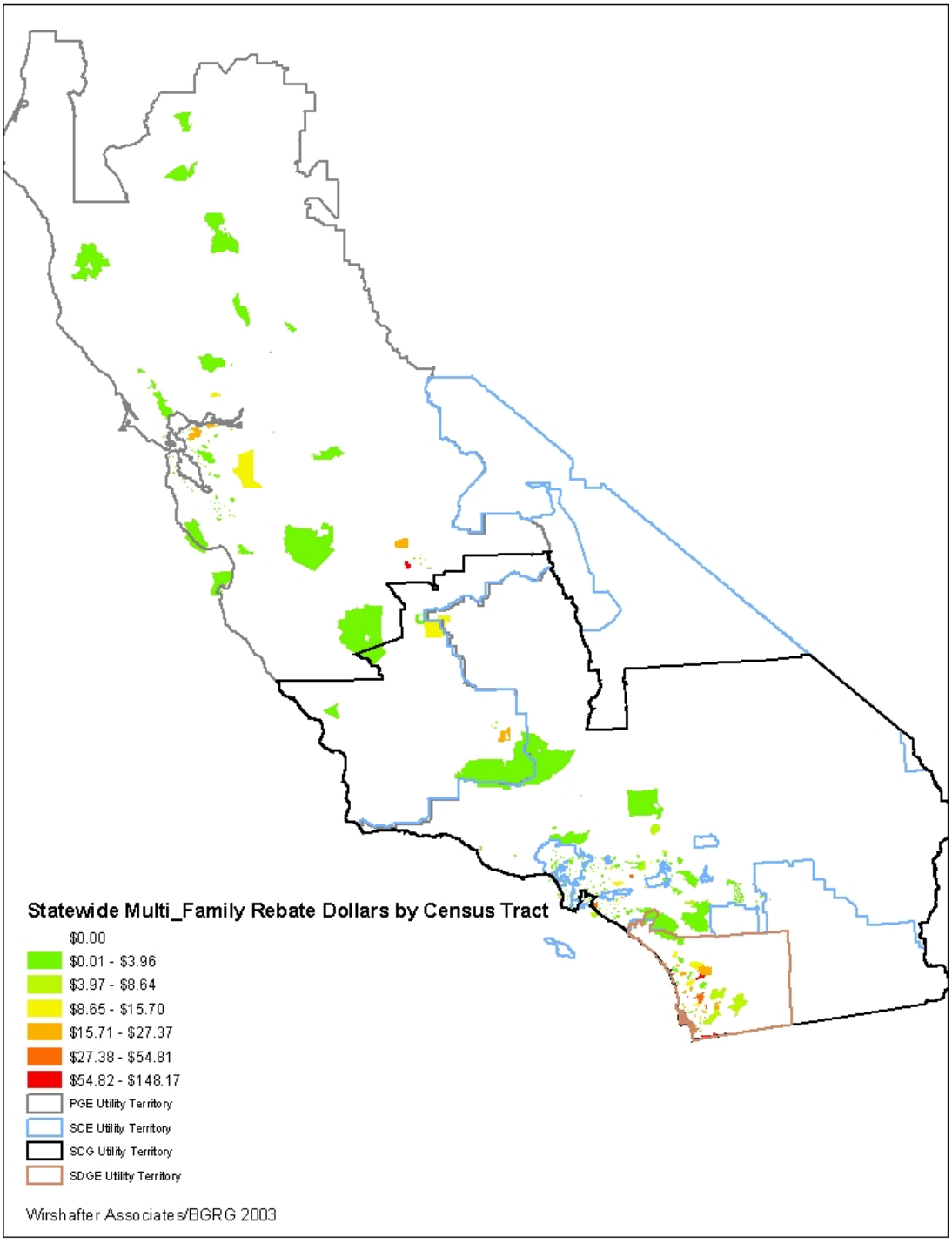


Figure 8-2: PGE Map of Multifamily Rebate Dollars by Census Tract ($/household)

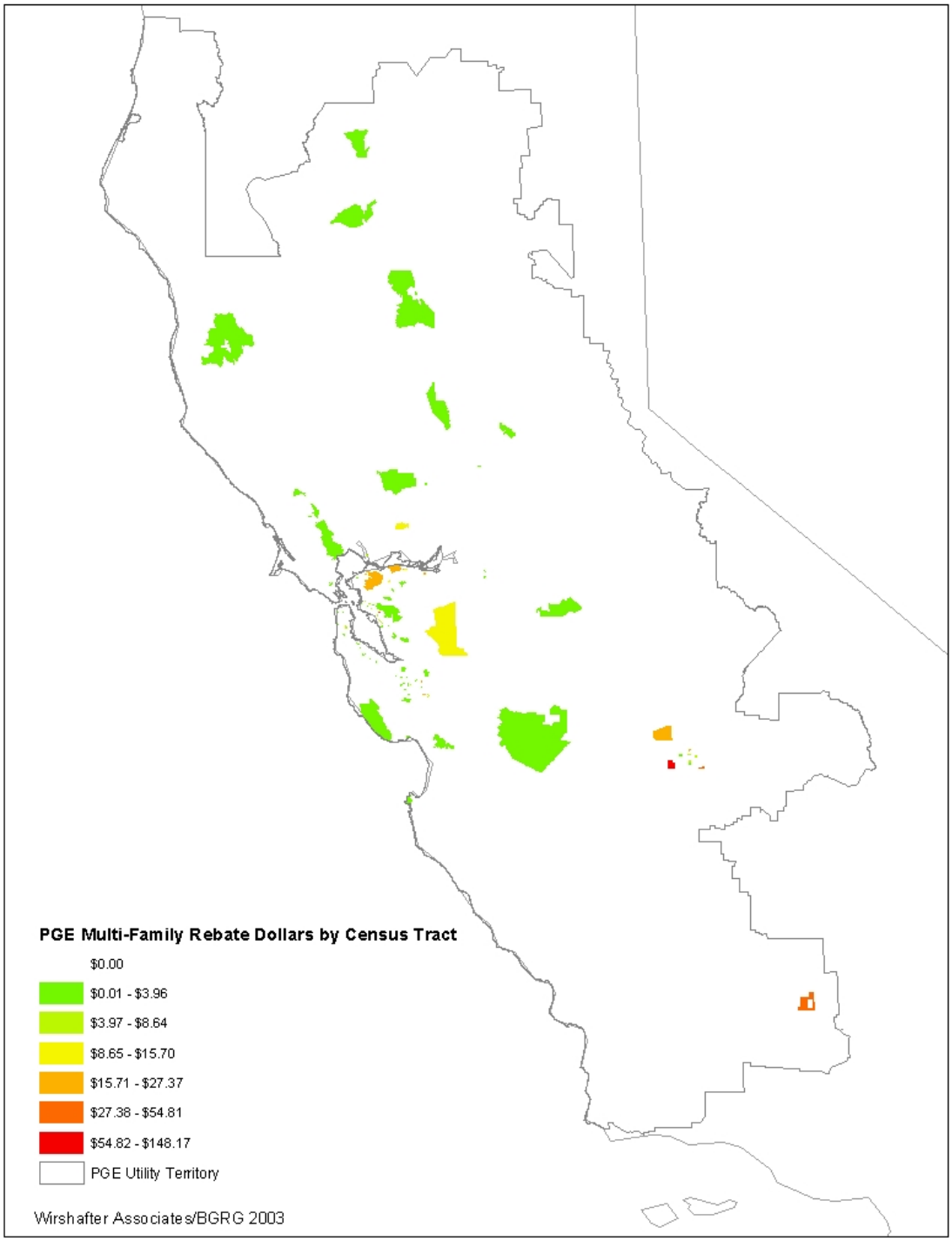


Figure 8-3: SCE Map of Multifamily Rebate Dollars by Census Tract ($/household)

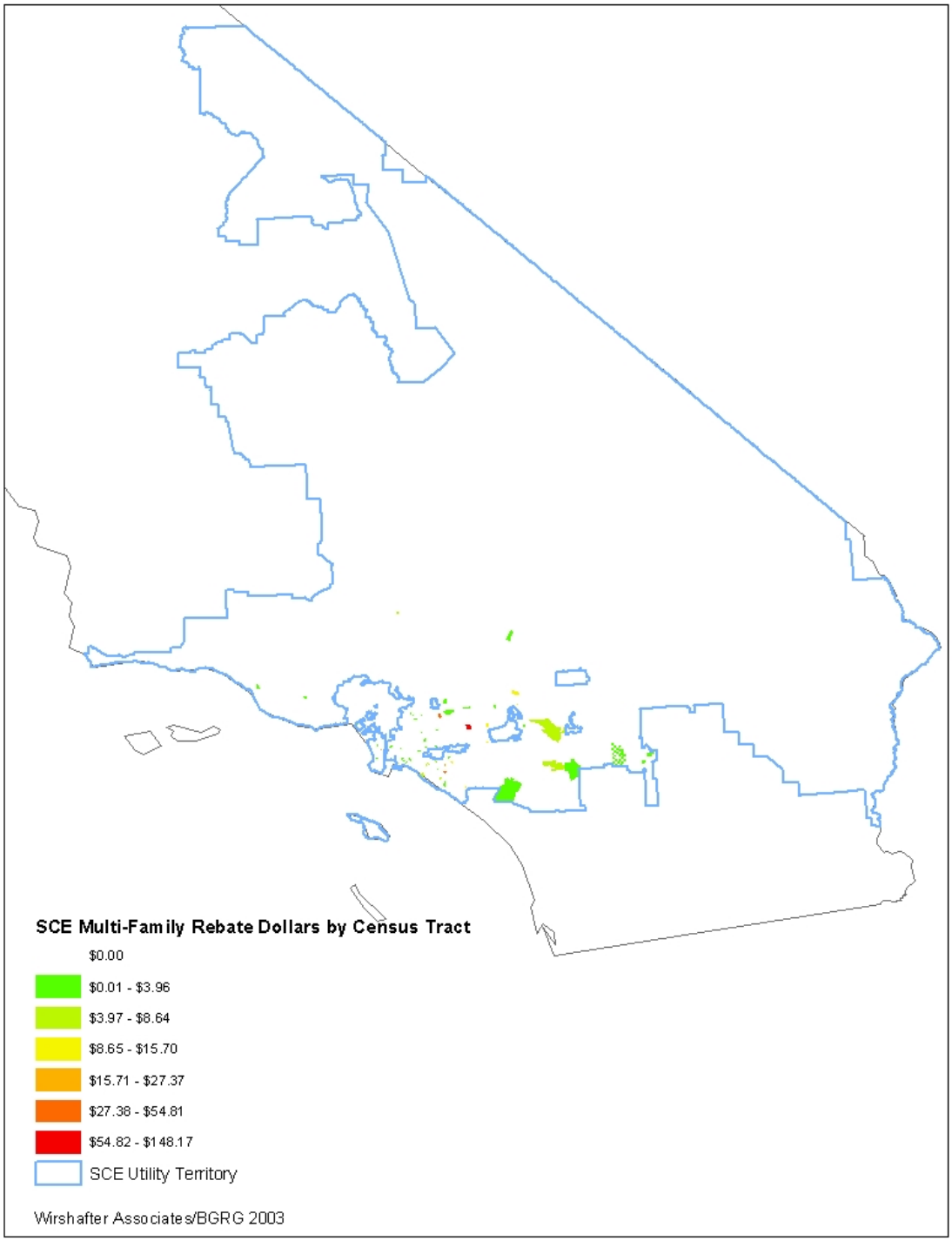


Figure 8-4: SCG Map of Multifamily Rebate Dollars by Census Tract ($/household)

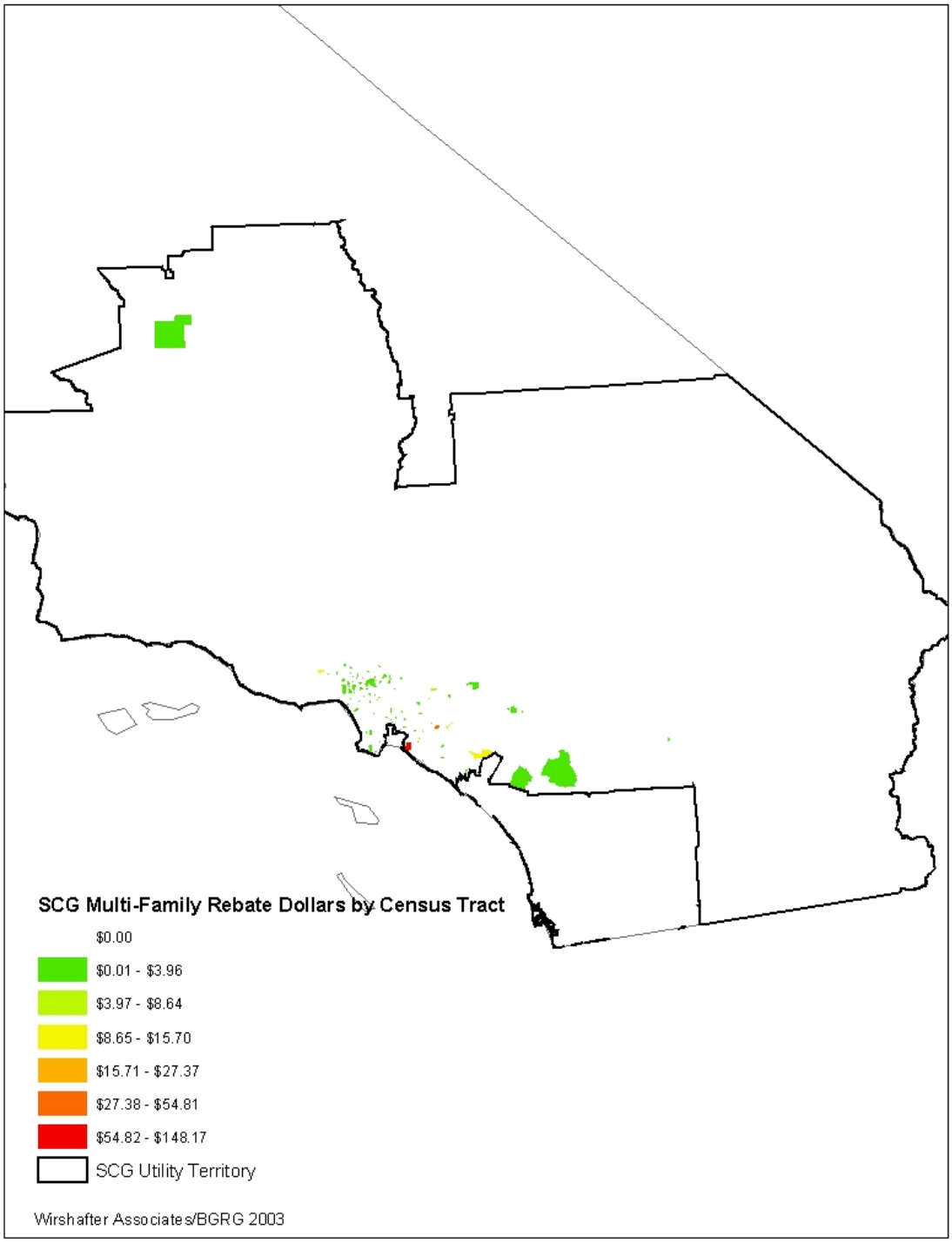


Figure 8-5: SDG&E Map of Multifamily Rebate Dollars by Census Tract ($/household)

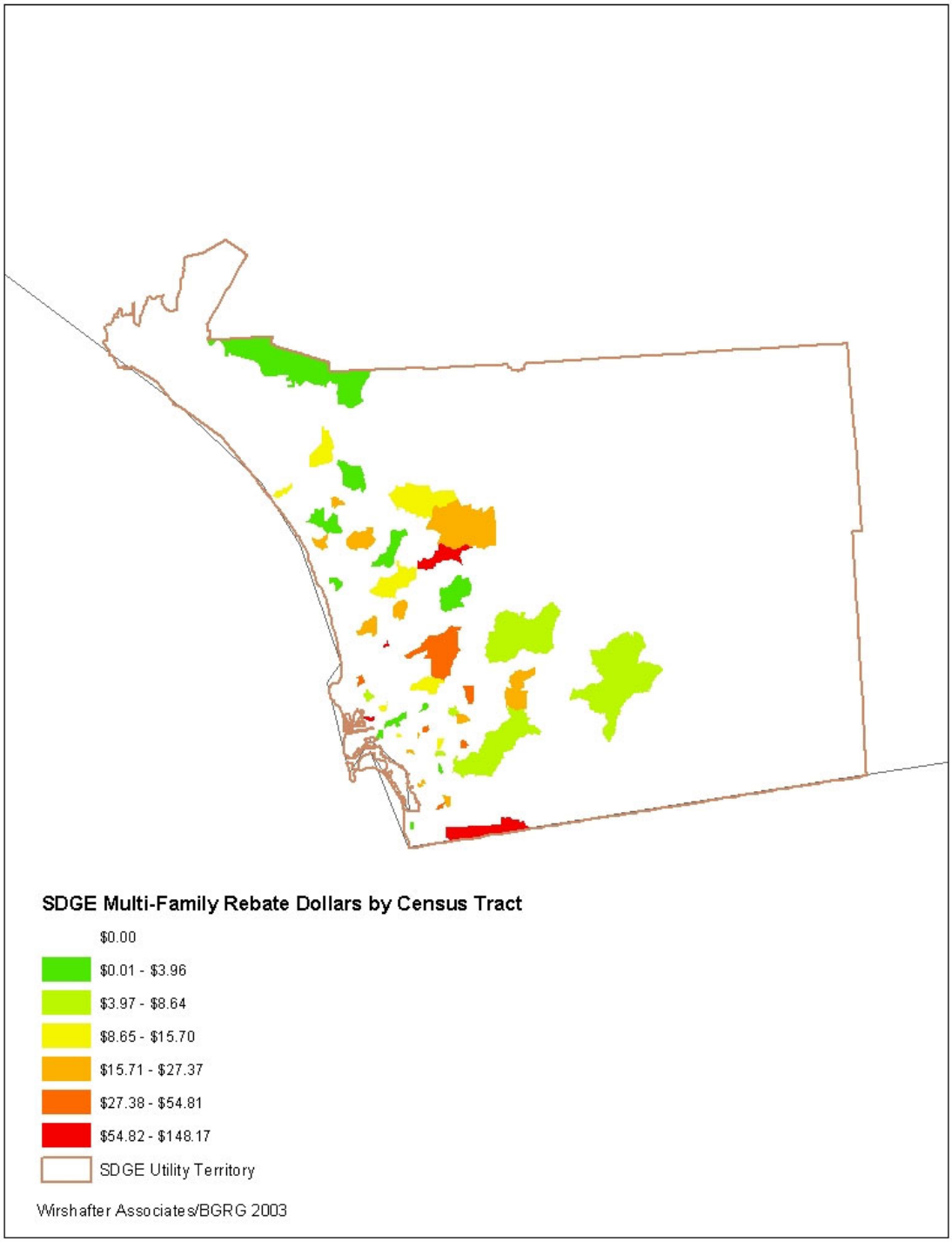


Table 8-2: Coverage of MFRP across Census Tracts

	Number of Census Tracts	Number of Census Tracts with MFRP Activity	Percentage of Tracts with MFRP Activity
PGE	2,751	101	3.67%
SCE	2,332	123	5.27%
SCG	3,549	128	3.61%
SDG&E	595	50	8.40%
All Utilities	6,750	362	5.36%

One possible explanation for this high concentration of activity in a few areas is that many tracts do not contain sufficient numbers of multifamily units to warrant marketing by contractors. Census data was used to calculate the number of multifamily units (not structures) in each census tract. The team then examined tracts with activity to identify patterns of distribution. As shown in Table 8-3, there is a significant range in the number of multifamily units in the active tracts. Program activity spans the range of tracts with respect to number of multifamily units. In general, activity is happening more often in tracts that are below the average size for each territory.

Based on the 2000 U.S. Census, a number of tracts have little or no multifamily structures with five or more units. Unfortunately, it does not appear that the Census count is consistent with the program activity records. There is program activity in areas where the Census says there are few or no multifamily units. No obvious explanation for this discrepancy is available. Some program activity is for mobile home parks, but this is not enough to explain the entire issue. Some of the difference may be in the counting of units within a complex or the structure. The Census only counts buildings with five or more units within a structure, while the program may include low-rise complexes with fewer units in each structure as long as the entire complex is over five units. It is also possible that some are units built since 2000. These data are presented here with the knowledge that the program contractors have found some areas where multifamily units exist, even though the Census reports little potential there.

Table 8-3: Distribution of Number of Multifamily Units in Active Tracts

	Average Number of Multifamily Units in Tracts with Activity	First Quartile: Number of Multifamily Units in Tracts with Activity	Median Number of Multifamily Units in Tracts with Activity	Third Quartile: Number of Multifamily Units in Tracts with Activity	Minimum Number of Multifamily Units in Tracts with Activity	Maximum Number of Multifamily Units in Tracts with Activity
PGE	430	21	215	708	0	2,004
SCE	486	16	231	652	0	3,900
SCG	718	40	378	1,054	0	6,042
SDG&E	337	8	118	574	0	2,452
All Utilities	527	19	261	746	0	6,042

Next, the team wanted to determine the extent to which areas within each utility service territory with large multifamily potential were not participating. Table 8-4 shows that even if tracts with less than 250 multifamily units are eliminated, there are still many tracts with large numbers of multifamily units that are not active. Even when tracts with less than 250 multifamily units are eliminated, coverage only increases to between 9.5 and 16%. There are large portions of these service territories where no activity is taking place even though there appear to be large numbers of multifamily units available. The next section looks to identify some characteristics of these tracts that differentiate them from those receiving attention from contractors.

Table 8-4: Coverage Percentages Using only Tracts with Large Numbers of Multifamily Units

	Number of Census Tracts with MFRP Activity	Number of Census Tracts with More than 100 Multifamily Units	Percentage of Multifamily >100-unit Tracts with Activity	Number of Census Tracts with More than 250 Multifamily Units	Percentage of Multifamily >250-unit Tracts with Activity
PGE	101	1,599	6.32%	1075	9.40%
SCE	123	1,364	9.02%	870	14.14%
SCG	128	2,238	5.72%	1557	8.22%
SDG&E	50	404	12.38%	310	16.13%
All Utilities	362	4,235	8.55%	2962	12.22%

The next step was to search for a pattern of distribution that would suggest that some groups are being less served by the program. Specifically, the team examined how well the program performed across the various HTR criteria established by the CPUC.

8.2.3 Are there Characteristics of the Active Tracts that Are Different from the Non-Active Tracts?

The team examined the characteristics of the active tracts compared to the non-active tracts to determine any distinguishing characteristics could be found that inform as to who is participating. Table 8-5 compares tracts that have had program activity and tracts with no activity for the average values of key characteristics. As can be seen, the average values are generally not different. In general, program activity tends to occur more often in tracts with slightly larger numbers of households. However, contractors in SDG&E tend to select tracts with smaller percentages of multifamily units, while the other three utilities see more activity in tracts with larger multifamily percentages. All four utilities are experiencing additional activity in the more rural tracts, although only in SDG&E's territory is this trend large enough to be statistically significant. The only other significant finding is that contractors in SCG's territory are more active on average in tracts with lower than average concentrations of Latino households.

Table 8-5: Comparison of Characteristics between Active and Non-Active Census Tracts

	PGE		SCE		SCG		SDG&E	
	Active	Non-Active	Active	Non-Active	Active	Non-Active	Active	Non-Active
Number of Tracts	101	2751	123	2332	128	3549	50	595
Average Number Total Housing Units	**1,957**	**1,712**	**2,030**	**1,590**	**1,886**	**1,616**	1,712	1,625
Average Number of Multifamily Units	**430**	**323**	**486**	**304**	**718**	**390**	337	441
Average Percentage of Multifamily Units	18.9%	16.9%	**21.6%**	**17.1%**	**31.5%**	**21.5%**	**16.9%**	**23.7%**
Average Percent Mobile Homes	4.1%	4.7%	5.1%	5.3%	3.6%	4.4%	3.3%	4.1%
Average Percent Multifamily or Mobile Homes	23.4%	22.0%	27.2%	22.8%	35.5%	26.3%	20.6%	28.3%
Average Percent Rural Households	13.7%	11.1%	5.5%	5.2%	5.3%	4.6%	**12.2%**	**3.6%**
Average Percent Non-White/Latino	35.6%	37.6%	47.7%	48.4%	45.6%	51.6%	32.4%	35.1%
Average Percent Afro-American	6.9%	6.0%	7.8%	6.3%	6.8%	7.2%	5.5%	4.9%
Average Percent Latino	14.3%	17.0%	26.5%	29.2%	**23.6%**	**32.1%**	15.9%	19.2%
Average Percent in Moderate Income Range	28.5%	32.4%	34.3%	34.5%	31.8%	34.8%	32.4%	33.4%

Bold values are significant using an independent samples test—t-test for equality, at 95% level. This indicates that the difference between the two means is unlikely (less than 1 in 20) to be just the result of random occurrence.

The reader should not jump to the quick conclusion that SCG contractors are excluding Latino households. Three factors complicate the statistics displayed above.

- The Census data are only available in aggregate statistics. It is not possible to identify households within a tract that are low income, non-white, and living in a multifamily

unit. It can also not be determined if one factor, such as income level, is disproportionately distributed across another factor such as housing type.

- Because there are separate low-income specific programs, the MFRP is designed to serve households above 150% of the poverty level. There is a very strong relationship between the percentage of non-white/Latinos and the percentage of households living below 150% of poverty level. This means that, proportionally speaking, more non-whites and Latinos are covered by the low-income initiatives. The MFRP, if it is operating principally in housing units above 150% of poverty, will likely attract a lower portion of Latinos and non-whites than are found in the general population.

- One cannot simply look at distribution of activity without considering how CPUC directives to push the program into HTR areas have affected coverage. The policy to encourage contractors to market to non-urban areas also affects the values for income and racial/ethnic composition.

Distribution of various factors can be reviewed in more detail to determine if average values are misleading. One way is to look at the distribution of funds, measured in rebates per household across various characteristics.

Looking at distribution of rebates will reveal what factors are most associated with higher rebate levels per household. Pearson Correlation was used to measure the relationship between the rebate per household and various factors. If the test results are significant, this implies a relationship between rebates per household and the factor that is likely not a random event. If the relationship is positive, then as that factor increases so does the amount of rebates per household. If it is negative, then as one factor increases, the other factor decreases. The measure of the strength of the relationship is the correlation coefficient. At 1.0, the two values are perfectly matched and changes in one results in proportional changes in the other. As the correlation coefficient drops, the strength of the relationship drops. If sample sizes are large enough, coefficients as low as 0.01 may detect a significant but weak relationship.

The results in Table 8-6 show the overall set of correlations between rebate totals per household and various measures of each tract's demographic characteristics. Few relationships produce significant correlations. Table 8-9 shows that the program's emphasis on selecting locations that are more rural has been successful overall, particularly in the SCE and SDG&E territories, however, SDG&E did not emphasize marketing to the rural zip codes. In general and as expected, the more rural a census tract, the more likely that the dollars received per household will be greater. The results also show that the utilities have had mixed results in targeting the program to areas where there are more moderate-income households. While PGE has a weak but significant and positive relationship between the amount of rebate per household and the percent of households in the moderate-income range, none of the other utilities shows that relationship. In fact, the general trend flows the other way towards greater participation in those tracts with lower percentages of moderate-income households. It is to be noted, however, that program goals and targeting were set at zip code level and not census tract level. What this analysis tells us is that targeting program using information at census tract level or even census block geography level will be more precise.

Table 8-6: Pearson Correlation to Rebate Amount per Household

	All Utilities	PGE	SCE	SCG	SDG&E
Percent Rural	**0.025***	0.024	**0.040***	0.001	**0.086***
Percent Latino or Non-White	-0.003	0.016	0.014	-0.012	0.027
Percent Multifamily	-0.012	-0.022	-0.005	0.022	-0.071
Percent Mobile Home	0.005	0.015	-0.006	0.031	0.002
Percent Mobile Home and Multifamily	-0.017	-0.018	**0.041***	-0.019	**-0.103****
Percent Black	0.000	0.014	-0.002	0.008	-0.008
Percent Latino	-0.003	0.018	0.018	-0.024	0.029
Percent of Households with Moderate Incomes	-0.023	**-0.061****	0.018	-0.015	-0.036
Percent of Households above 150% of Poverty	**-0.095****	0.008	-0.010	0.019	-0.050

* significant at the 5% level
** significant at the 1% level

Table 8-7 and Table 8-8 show the distribution of fund dollars across racial and income categories. The tracts are divided into groups based on the percentage of households in that category. This allows average funding for the 10% of tracts with the least concentration of non-white/Latinos to be compared with the 10% of tracts with the highest concentration. Neither table shows an overwhelming bias towards or against a particular grouping. Activity in SDG&E's territory appears more pronounced in both tracts with the least number of non-white/Latinos and highest number of non-white/Latinos.

Table 8-7: Rebates per Household by Tract Racial Composition

Percentiles by Percent of Households that Are Either Non-White or Latino *(range of values*)	**All Utilities**	**PGE**	**SCE**	**SCG**	**SDG&E**
Average all Tracts	$0.25	$0.21	$0.29	$0.08	$1.25
10% of Tracts with Least Percentage of Non-White or Latino.	$0.28 *(<12%)*	$0.07 *(<10%)*	$0.38 *(<14%)*	$0.12 *(<14%)*	$1.72 *(<10%)*
10 to 25%	$0.22 *(12 to 20%)*	$0.12 *(10 to 17%)*	$0.12 *(14 to 22%)*	$0.11 *(14 to 24%)*	$1.06 *(10 to 14%)*
25 to 50%	$0.19 *(20 to 39%)*	$0.17 *(17 to 32%)*	$0.35 *(22 to 43%)*	$0.06 *(24 to 48%)*	$1.03 *(14 to 27%)*
50 to 75%	$0.37 *(39 to 69%)*	$0.44 *(32 to 54%)*	$0.27 *(43 to 74%)*	$0.10 *(48 to 79%)*	$1.46 *(27 to 50%)*
75 to 90%	$0.22 *(69 to 91%)*	$0.09 *(54 to 77%)*	$0.40 *(74 to 92%)*	$0.05 *(79 to 95%)*	$1.22 *(50 to 78%)*
10% of Tracts with Highest Percentage of Non-White or Latino	$0.09 *(>91%)*	$0.25 *(>77%)*	$0.11 *(>92%)*	$0.02 *(>95%)*	$1.13 *(>78%)*

Table 8-8 uses a statistic developed in the Residential Needs Assessment Study that was labeled Percent of Moderate Income Households. This statistic measures the approximate number of households that fall between 150% and 400% of the poverty level. The Residential Needs Assessment Study recommended that this group be targeted for more involvement in the program. It cannot be said that any of the utilities who targeted this segment have been outright successful in concentrating activity in those tracts with the highest percentages of moderate-income households.

Table 8-8: Rebates per Household by Tract Percentage of Tract that Has Moderate Income

Percentiles by Percent of Households With Moderate Incomes (150 to 400 of Percent Poverty Level)	All Utilities	PGE	SCE	SCG	SDG&E
Average all Tracts	$0.25	$0.21	$0.29	$0.08	$1.25
10% of Tracts with Least Percentage of Moderate Income Households	$0.30 *(<18%)*	$0.1 *(<17%)*4	$0.33 *(<18%)*	$0.27 *(<18%)*	$0.84 *(<19%)*
10.01 to 25%	$0.29 *(18 to 26%)*	$0.20 *(17 to 26%)*	$0.17 *(18 to 25%)*	$0.06 *(18 to 26%)*	$2.60 *(19 to 25%)*
25.01 to 50%	$0.24 *(26 to 35%)*	$0.20 *(26 to 35%)*	$0.22 *(25 to 35%)*	$0.06 *(26 to 34%)*	$1.63 *(25 to 34%)*
50.01 to 75%	$0.25 *(35 to 42%)*	$0.32 *(35 to 42%)*	$0.42 *(35 to 41%)*	$0.05 *(34 to 41%)*	$0.46 *(34 to 41%)*
75.01 to 90%	$0.17 *(42 to 47%)*	$0.18 *(42 to 47%)*	$0.26 *(41 to 47%)*	$0.04 *(41 to 47%)*	$1.16 *(41 to 46%)*
10% of Tracts with Highest Percentage of Moderate Income Households	$0.32 *(>47%)*	$0.07 *(>47%)*	$0.31 *(>47%)*	$0.18 *(>47%)*	$1.10 *(>46%)*

Having looked at the distribution of activity, the biggest concern lies not with the exclusion of particular types of households, but with the limited reach of the current effort to all parts of the utility service territories. The program must concern itself with reaching more than the few tracts it now does. The reader is reminded again that the activity illustrated in Figure 8.1**Error! Reference source not found.** leaves most of the state untouched. The map looks strikingly similar to those produced for the RCP several years ago. A principal cause of the earlier map's distribution was the location of the contractors. The team did not have the opportunity to explore this issue here, but it is suspected that contractors look for multifamily clients near where they work or along the major roads, just as they did with the RCP. If the program desires a wider distribution, it should require that contractors limit the number of jobs in a specific area, provide additional incentives to contractors who first develop new areas, or work to recruit contractors in other locales.

8.2.4 What Effects Have the HTR Goals Had on the Distribution of Rebates?

The results in Table 8-6 are made without an appreciation for the underlying relationship between market potential and program accomplishment. If the program was more active in areas that were rural, was this because the program worked hard to enlist apartments in rural areas, or is the natural distribution of apartments such that one would expect to see more activity there? Table 8-9 shows the underlying relationship between the characteristics of the tracts and the percent of the tract that is multifamily. There is some under-reporting of the multifamily (by the

program's definition) segment in the Census data, but that value represents the best measure of multi-units in the database. Table 8-10 combines the multifamily and the mobile home counts to capture the full extent of the program's reach.

Table 8-9 reveals very large and significant correlations between the percent multifamily and the key demographic characteristics related to the HTR analysis. The strongest relationship found is that rural tracts are less likely to have high percentages of multifamily units. Even when adding mobile homes into the mix in Table 8-10, there remains a very strong negative correlation between percent rural and percent of housing that is either multifamily or mobile. This says that the more rural an area is, the less likely it will have larger number of households eligible for this program.

This means that the program achievement of obtaining a positive correlation between rebates and the percent rural found in Table 8-6 is even stronger than straight results suggest. The program has been extremely successful in targeting this program to the more rural areas, even though there are proportionally less eligible multifamily and mobile homes households in these areas.

Table 8-9: Pearson Correlation to Percent of Tract that Is Multifamily

	All Utilities	PGE	SCE	SCG	SDG&E
Percent Rural	**-0.236****	**-0.284****	**-0.200****	**-0.207****	**--0.235****
Percent Latino or Non-White	**0.195****	**0.180****	**0.165****	**0.206****	**0.210****
Percent Black	**0.109****	**0.132****	**0.137****	**0.080****	**0.117****
Percent Latino	**0.086****	-0.011	**0.073****	**0.096****	**0.194****
Percent of Households with Moderate Incomes	0.005	**0.049***	-0.012	-0.031	0.007
Percent of Households above 150% of Poverty	**-0.192****	**-0.237****	**-0.308****	**-0.366****	**-0.122****

* significant at the 5% level
** significant at the 1% level

Table 8-10: Pearson Correlation to Percent of Tract that Is Multifamily or Mobile Home

	All Utilities	PGE	SCE	SCG	SDG&E
Percent Rural	**-0.195****	**-0.226****	**-0.174****	**-0.171****	**--0.192****
Percent Latino or Non-White	**0.198****	**0.151****	**0.141****	**0.236***	**0.222****
Percent Black	**0.073****	**0.101****	**0.085****	**0.046****	**0.110***
Percent Latino	**0.125****	-0.001	**0.088****	**0.165****	**0.205****
Percent of Households with Moderate Incomes	**0.043****	**0.054***	**0.069****	0.022	0.088
Percent of Households above Poverty	**-0.028***	-0.029	**0.077****	-0.034	-0.045

* significant at the 5% level
** significant at the 1% level

Looking further into the relationship between Table 8-6 and Table 8-9 shows that the emphasis on rural areas comes at a cost of reaching other HTR sub-categories. Table 8-9 indicates that there is a very strong relationship between percent of multifamily and percentage of non-white/Latino families. A similar set of relationships exists when using the percentage of both multifamily and mobile homes as shown in Table 8-10. This indicates that the achievement of reaching non white/Latino families shown in Table 8-6 is even weaker than the table values suggest.

Because areas with higher concentrations of multifamily units also have higher concentrations of non-whites and Latinos, the program should also show relatively high activity in areas with large concentrations of non-whites and Latinos. The negative relationship between program funds and percent non-white/Latino shown in Table 8-6 actually indicates a distribution of funds away from this sector of the multifamily class. Because the MFRP targets households above 150% of poverty and in rural areas, it is bound to have lower activity by non-whites and Latinos than might have been expected had the program been targeted equally across all areas.

Rural locations are not a good place to market this program. Figure 8-6 shows all of the 2000 Census tracts in California where greater than 10% of the tract's households are classified as being rural. Figure 8-7 shows the subset of these rural Census tracts with 25 or more multifamily units. Only a few isolated rural areas have a critical mass of multifamily units. While it appears most of the state is included in the figure, only a small portion of the entire state population is represented. The darkened area in Figure 8-7 represents only 76,700 multifamily units—just 2% of the state's total. Only when the mobile home count is added, as seen in Figure 8-8, do these rural areas have much program potential. Even so, the shaded areas only have 330,000 multifamily and mobile units combined. This is less than 8% of the total number of multifamily and mobile units found in California.

Figure 8-6: California Census Tracts with More than 10% of Households Classified as Rural

Figure 8-7: California Census Tracts with More than 10% of Households Classified as Rural and with More than 25 Multifamily Housing Units

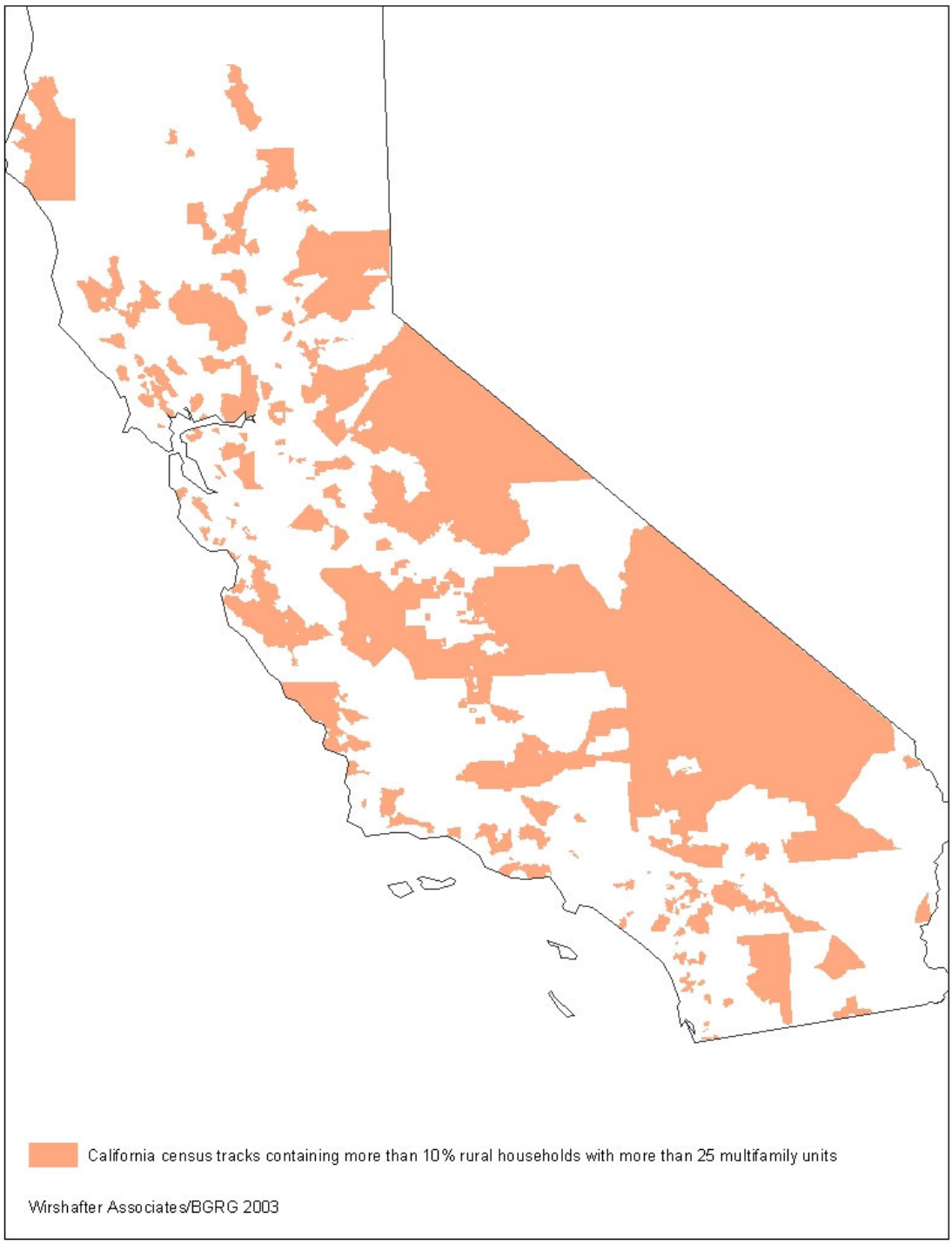


Figure 8-8: California Census Tracts with More than 10% of Households Classified as Rural and with more than 50 Multifamily Housing Units and/or Mobile Homes

8.3 Recommended Changes to HTR Activities and Priorities

The 2002 EM&V studies are the first set of evaluations to assess the HTR efforts of the program. The results of the GIS analysis identify issues and suggest how the implementation of the HTR efforts can be improved. Some issues derive from the specific methods chosen to set the goals, implement the efforts, and measure the results. While addressing some of these program-specific issues, it is important to tie the individual program effort to the overall CPUC goal of reaching HTR customers. The discussion below builds from program-specific issues to issues needing modifications in the overall CPUC policy.

First to be discussed are the goals as set by the utilities and whether they are appropriate. Then, the discussion centers on issues related to how the utilities have implemented the HTR efforts and tracked progress. Finally, broader issues for the CPUC are discussed. Of particular concern is the CPUC directive to design, implement, and measure HTR success at the program level.

8.3.1 Assessment of the MFRP HTR Goals.

Each utility has its own basis for setting HTR goals. One of the issues confusing the evaluation of these secondary HTR goal achievements is the manner in which each utility has set its goal. Each utility has used a very different set of standards, which the CPUC approved, for deciding which applications qualify as HTR. These individual approaches have created a broad variation in goals ranging from 10% to 90% of total participants must be from the zip codes defined as HTR. No framework common across the four utilities exists upon which to assess the appropriateness of these individual goals, the goal values in relationship to overall markets, or the level of difficulty each utility has in reaching these sub-markets. The goal of 90% as defined by SDG&E may be easier to achieve than the 10% goal set by SCG.

The goal of promoting emphasis in rural areas is counterproductive. The analysis above shows the problems a single program encounters when it individually tries to address all HTR issues simultaneously. While it would be ideal with respect to meeting HTR goals to target the energy-efficiency programs to customers who are simultaneously rural and non-English-speaking and non-white and of moderate income, the fact remains that there are few such individuals possessing all four of these characteristics. In setting the HTR goals for a specific program, it is necessary to match the sub-set of HTR criteria to be addressed by the program with the characteristics of the customers for whom the program is designed to address.

The MFRP cannot deliver effectively and efficiently a multifamily program targeted to multifamily customers while at the same time focusing on rural areas because this is not where the bulk of multifamily households exist. As the program continues, it will be increasingly more difficult to find non-participant multifamily complexes in these areas. Of course, the program could continue to focus on rural areas by pushing the program to mobile home parks. This is certainly a possible option, but such a move should be accompanied by program enhancements favorable to the mobile home market. It may make more sense to design a specific program for mobile homes.

The emphasis on secondary goals such as rural or moderate-income targets detracts from the all-important goal of reaching multifamily units. Reaching the multifamily market is a

worthy goal in itself. The entire multifamily segment has long been underserved as a result of recalcitrant, embedded market barriers that are fundamental to this market segment. The MFRP is one of the first programs that has succeeded in bringing any type of program benefits to the tenants in these complexes, and the goal should be to reach the broadest possible market of multifamily customers. There are areas of each service territory with large concentrations of multifamily households that are receiving no benefits from MFRP. Many of these areas have low involvement because they are farther away from the existing group of contractors who are driving program interest. While targeting moderate-income areas is okay, (targeting rural is less appropriate as noted above), this should not be the exclusive concern. The program more importantly needs to build coverage across these other underserved areas.

Note that there are upwards of 2.8 million multifamily units in California contained in approximately 125,000 to 150,000 multifamily buildings. At the current level of funding, the program will never run out of potential markets or serve everyone in this market segment. Therefore, it is important to reach the broadest range of multifamily households while monitoring that no groups are receiving unjustified shares of the funds.

In developing a marketing and program-delivery strategy to reach MF households, it is most efficient to try to build a program that reaches the broadest possible niche first, and then refine the message and delivery options to reach the sub-markets not responding to the broader approach. When a need is determined to reach a sub-market that does not respond to the broad market message, it is best to define that sub-market in the most precise manner possible. For example, if language is a barrier to participation, messages need to be developed in the specific languages to effectively reach that sub-market. With the information collected in this analysis, MFRP can offer a broadly targeted program, and pinpoint underserved areas and the characteristics of the households in those areas.

8.3.2 HTR Implementation Issues

When targeting the MF program to specific HTR criteria, using zip codes is too broad in many cases: As noted above, the program should strive to reach the broad market, but when narrowing in on specific sub-markets should do so in as precise a way as possible. The utilities set original target priorities by selecting a set of zip codes to include as HTR areas. While the zip codes were selected using Census information, in most cases, the zip code level is too aggregated a spatial measure to distinguish HTR households from non-HTR households accurately.

A randomly selected zip code was used to illustrate the level of aggregation found at the zip code level. As Table 8-11 shows, there is potentially significant variation within this sample zip code. In the example shown, the individual tracts show pockets of households who would qualify as HTR. Yet, taken together, this zip code does not meet the rural or moderate-income criteria. All activity in this zip code would be classified as non-HTR.

Table 8-11: Variation of HTR Characteristics within Zip Code

Zip Code 92071, Santee, California – SDG&E Service Territory Area = 39.5 square miles, Population = 53,367							
Census Tract	Total Housing Units	Rental Units (% of total)	Mobile Homes (% of total)	Multifamily Units (% of total)	Rural Units (% of total)	Non White and/or Latino (% of total)	Moderate Income (% of total)
1	1,131	12.0%	0.0%	5.9%	0.0%	13.9%	13.4%
2	2,821	27.4%	0.0%	21.1%	0.3%	22.5%	15.6%
3	3,135	24.8%	36.5%	11.0%	0.0%	12.7%	37.3%
4	1,041	26.1%	0.0%	14.4%	0.0%	14.5%	30.8%
5	2,328	24.9%	28.2%	12.6%	0.0%	11.5%	29.5%
6	783	10.1%	0.0%	0.0%	0.0%	13.7%	25.9%
7	1,753	21.4%	0.0%	13.3%	0.0%	12.7%	21.7%
8	1,485	24.6%	0.0%	23.6%	0.0%	13.9%	41.0%
9	1,985	17.4%	0.0%	4.4%	0.0%	12.7%	26.6%
10	760	25.0%	0.0%	17.6%	0.0%	14.9%	31.4%
11	1,337	22.1%	0.0%	13.8%	0.0%	16.3%	29.3%
12	661	43.1%	0.0%	30.9%	0.0%	12.9%	33.3%
13	1,544	40.1%	8.0%	13.5%	0.0%	20.5%	37.4%
14	1,410	35.7%	38.9%	12.0%	0.0%	9.7%	44.7%
15	2,686	42.5%	7.3%	31.2%	0.0%	13.9%	34.4%
16	2,773	56.2%	3.0%	39.4%	0.0%	15.6%	40.9%
17	2,416	21.7%	16.2%	5.3%	18.7%	13.4%	38.0%
Entire zip code	30,049	29.4%	10.5%	16.9%	1.5%	14.6%	31.7%

The program should market itself to areas with the greatest potential. The program's goal should be to push the program into areas where there has been little activity yet great potential for finding applicable multifamily units. The GIS system helps identify specific census tracts where large numbers of potential candidates are located. This is defined as areas with more than 250 multifamily households and larger than average numbers of families in the moderate-income range (<32%).

- Figure 8-9: PGE: Areas with Large Market Potential
- Figure 8-10: SCE Areas with Large Market Potential
- Figure 8-11: SCG Areas with Large Market Potential
- Figure 8-12: SDG&E Areas with Large Market Potential

Table 8-12: Selection of Tracts with Large Market Potential

Utility	Number of Prime Marketing Tracts (>250 Multifamily units and >.32 % Moderate Income)	Number of Prime Marketing Tracts with Activity in 2002
PGE	600	19
SCE	640	44
SCG	1,138	47
SDG&E	227	13

Figure 8-9: PGE: Areas with Large Market Potential

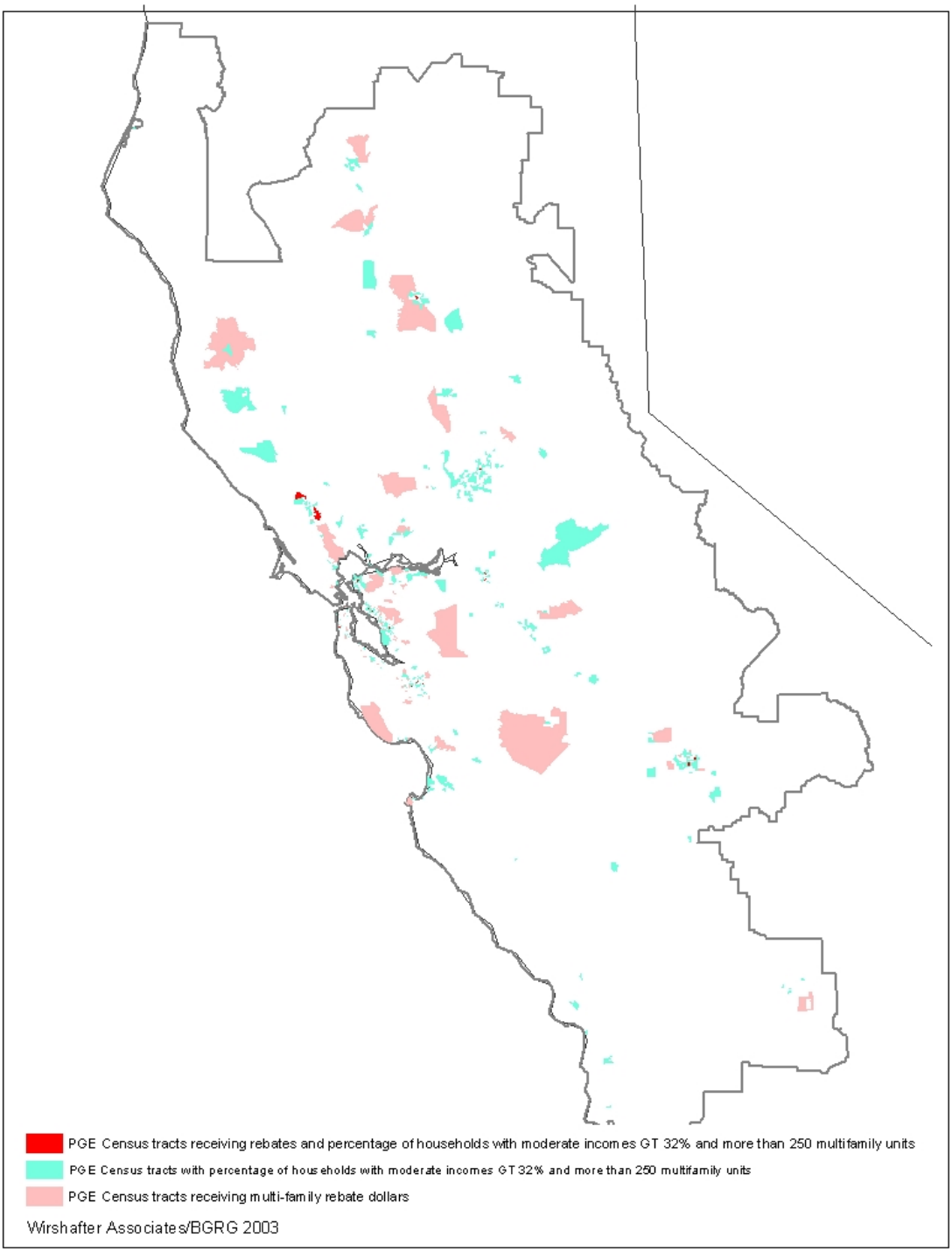


Figure 8-10: SCE Areas with Large Market Potential

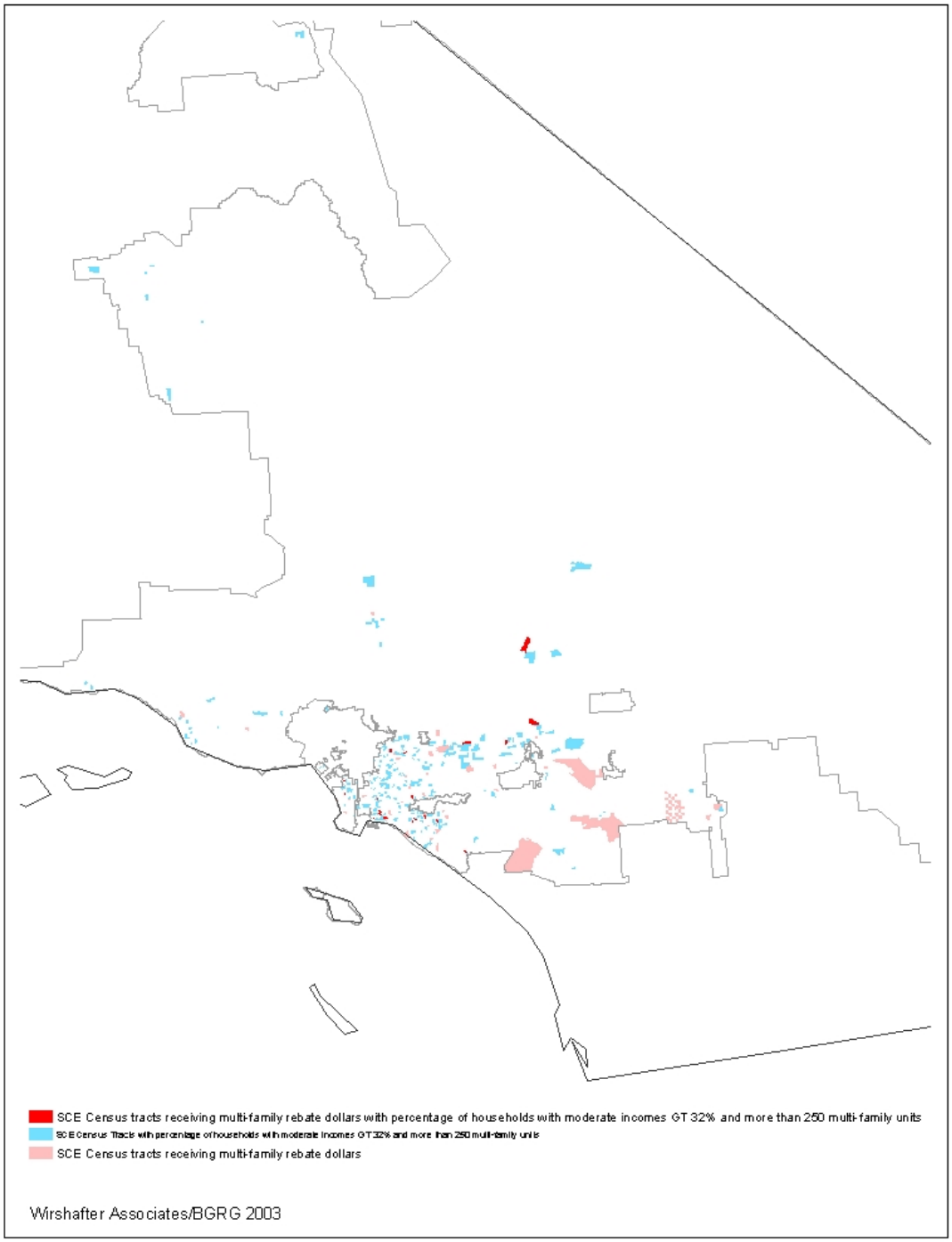


Figure 8-11: SCG Areas with Large Market Potential

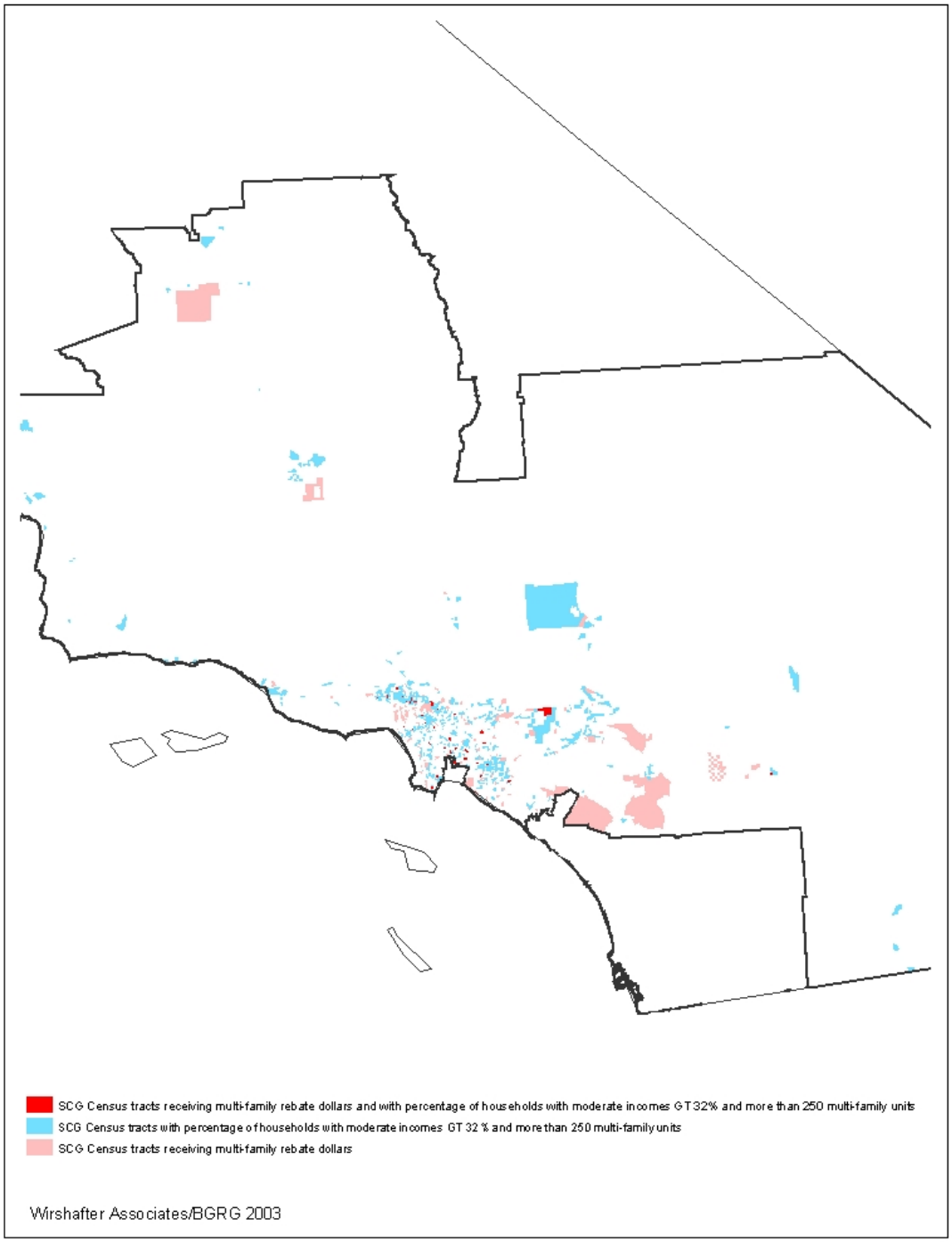
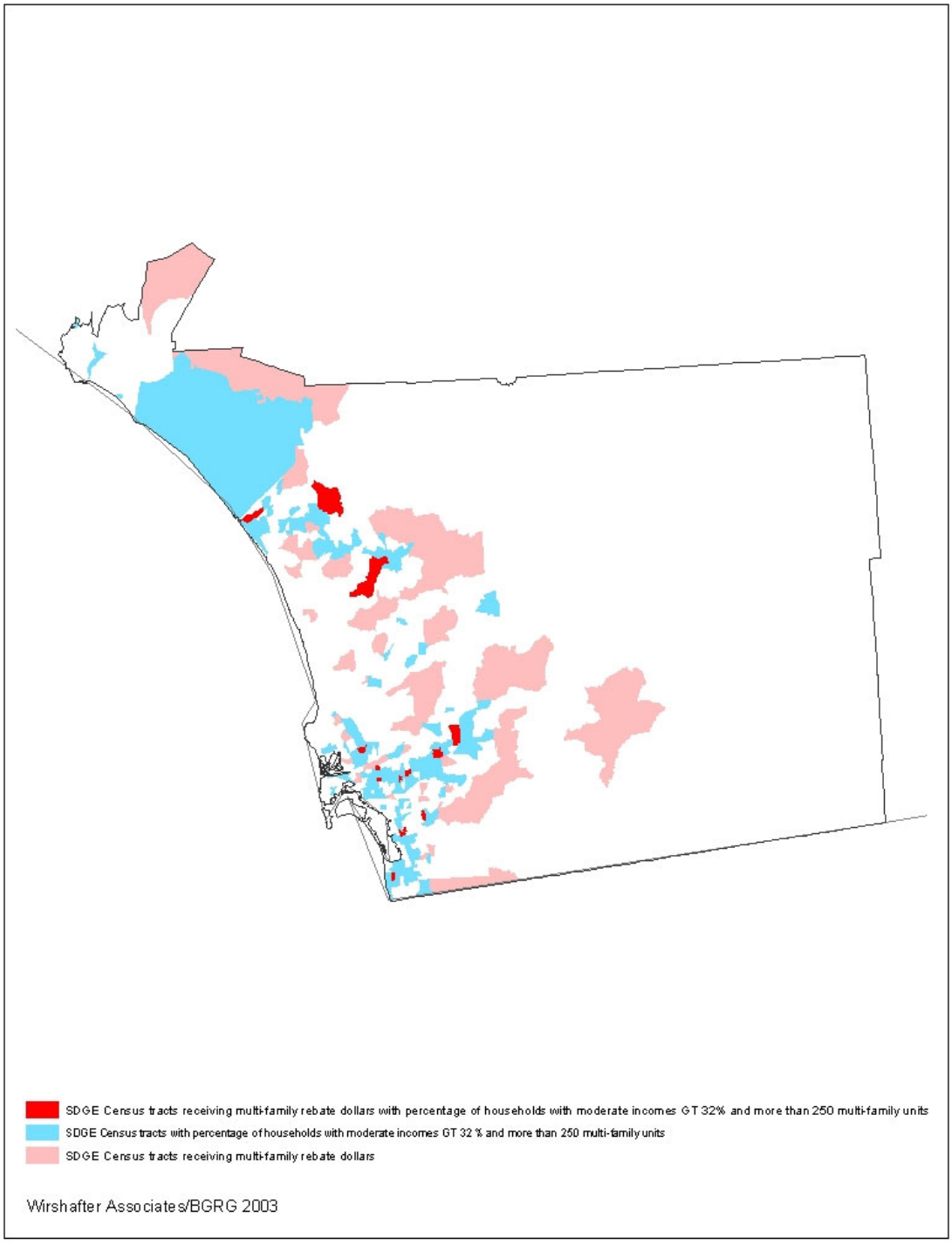


Figure 8-12: SDG&E Areas with Large Market Potential



8.3.3 Recommended Changes to CPUC Policy

The CPUC's concern for reaching groups of customers who are traditionally not participating in the utility programs is laudable. There is strong justification for the design of programs and initiatives within programs to offer to and attract HTR households. As the current efforts mature, there are two guiding principles the CPUC should consider in implementing HTR efforts. HTR achievement needs to be designed and assessed at the portfolio level. Additionally, data on participation should be collected and assessed to design programs and redefine the exact composition of those who are HTR. Below is a detailed discussion of these two points. The CPUC is encouraged to consider these two points in addressing future HTR policy.

HTR Achievement Must Be Assessed at the Portfolio Level. The current CPUC emphasis of setting goals for individual programs and measuring achievement at the program level should be reassessed. The real measure of success must be how well the overall portfolio of programs reaches all segments of the population. Three important concepts are missing from the current CPUC policy approach.

- To reach HTR sub-groups effectively will require programs tailored to attract that specific group. These programs will not be universally applicable to the broader set of utility customers. If the group reached by the program is indeed HTR, then the program is effective.

- Each utility's accountability in addressing HTR should be assessed at the aggregate level and not by individual programs. The utilities themselves may set HTR for each program manager, but those goals should be drawn to bring the entire portfolio into compliance and not to try to make every program HTR neutral. Each utility should be developing a portfolio of programs that fairly distributes PGC funds across the entire class of customers. A good portfolio may contain some programs that are not very attractive to the HTR groups (new construction for example); as long as there are others included that specifically target these groups. Assessing each program individually ignores the purposeful targeting that is needed. In fact, as is the case here, it discourages programs from identifying underserved niches and marketing to them directly. Broad HTR goals applied across all programs individually will not create the type of targeted programs that will be most effective.

- There should be a balance between requiring each program to have a HTR goal and having programs exclusively designed for HTR. While in some program cases, it will be cost effective to serve HTR and non-HTR segments together due to economies of scale, in other cases programs may need to be specially designed for HTR. It may even be that such exclusive programs may be piggybacked on existing general population program.

Data on participation should be collected and assessed to design programs and redefine the exact composition of those who are HTR. The analysis demonstrated here will give utilities important information on the distribution of benefits across the customers in their service territories. As these data become available, it is important that the definitions of HTR be refined to reflect the reality of who is and who is not participating. Over time and with better data, the CPUC and the utilities will be able to better define the HTR segments so that what now may be

"all multifamily" may eventually be "moderate income, non-white occupied units," or units in specific census tracts. As the group is better defined, so too should the program design and marketing become more specific in its reach to these audiences.

9. SYNTHESIS AND RECOMMENDATIONS

As a newly designed program intended to target largely untapped markets, the MFRP was likely to encounter numerous challenges. Much to the credit of the program management team, the PY2002 program was not only designed and initiated but, most importantly, was operated successfully with funds fully subscribed on the electric side. The program's success in PY2002 led program managers to initiate a reservation system and adjust some of the rebate levels for PY2003.

Most contractors and property managers found the program administration, paperwork requirements, and payment processing tolerable. The major concerns centered on the program's timing in opening and closing. In PY2002, the quick commitment of available funds caught some contractors off-guard. The reservation system initiated in PY2003 ensures that contractors have secured the rebate commitment before beginning a job.

The claimed savings made by each of the utilities, both electric and gas, were validated and accurately computed. Table 9-1 shows the claimed savings.

Table 9-1: Summary of Program Savings

		Gross Filed Energy Savings	Net Filed Energy Savings	Net Energy Goals
Lighting (kWh)	All Utilities	10,577,445	8,814,121	N\A
	PG&E	2,439,382	2,171,050	N\A
	SCE	6,664,501	5,331,601	N\A
	SDG&E	1,473,562	1,311,470	N\A
Other Electric (kWh)	All Utilities	465,510	413,938	N\A
	PG&E	347,517	309,290	N\A
	SCE	104,194	92,367	N\A
	SDG&E	13,799	12,281	N\A
Total Electric (kWh)	All Utilities	11,042,955	9,228,059	17,406,489
	PG&E	2,786,899	2,480,340	6,116,005
	SCE	6,768,695	5,423,968	8,850,000
	SDG&E	1,487,361	1,323,751	2,440,484
Total Gas (therms)	All Utilities	581,411	517,456	1,563,569
	PG&E	78,932	70,250	708,970
	SCG	318,907	283,827	575,000
	SDG&E	183,572	163,379	279,599

PG&E = Pacific Gas & Electric
SCE = Southern California Edison
SCG = Southern California Gas Company
SDG&E = San Diego Gas & Electric

Within the context of this overall success, the evaluation did identify several issues and provide recommendations for PY2004 and beyond.

- Work with contractors and property managers to increase lighting retention,
- Restricting lamp installation to high use applications,
- Increasing program funds,
- Adjusting rebate levels,
- Creating electronic application,
- Marketing for gas applications,
- Developing a hard-to-reach plan, and

9.1 Addressing the Number One Issue: Work with Contractors and Property Managers to Increase Lighting Retention

The biggest issue identified in this evaluation is the need to work with contractors, property owners, and lighting manufacturers to increase lighting fixture and lamp quality and increase the retention rate for lighting installed. The on-site inspections revealed that a large number of the lighting measures are being removed or are failing after installation. As shown in Table 9-2, the verification process found that a significant number of claimed screw-in CFLs are no longer in use. Retention rates were much higher for hard-wired fixtures. For all of the larger HVAC equipment, 100% verification ratios were obtained.

Table 9-2: Verified Electric Measures with Less Than 100% Verification Ratios

Measure Description	Verification Ratios			
	PG&E (listed)	SCE (listed)	SCG (listed)	SDG&E (listed)
CFL – 13 watt	100% (55)	61% (95)		
CFL – 16 watt	74% (144)	73% (202)		
CFL – 20 watt		99% (216)		
Outdoor Hard-wired Fixture – 13 watt CFL	96% (278)	94% (446)		
Indoor Hard-wired Fixture – 27 watt CFL	91% (141)	70% (160)		99% (69)
Programmable Thermostat		96% (24)	100% (3)	
Occupancy Sensors	40% (5)	60% (5)		
Photocells		87% (15)		
Low-Flow Showerhead			89% (18)	

The interviews and survey of property managers also reinforce the prevalence of quality issues for lighting measures. As Table 9-3 illustrates, more than one-third of the property managers interviewed had some issue with the program. Virtually all of that dissatisfaction resulted from poor quality lighting.

Table 9-3: Overall Satisfaction with Program and Its Components by Utility

	UTILITY				Total
	PGE	SCE	SCG	SDG&E	
Not Completely Satisfied	7	20	6	24	57
Completely Satisfied	17	35	21	20	93
Percent Satisfied	71%	64%	78%	45%	62%

There are a number of reasons why lamps that were reported installed are not found when inspectors visit the apartments a half a year to a year later. These reasons include:

- Lamps were never installed
- Lamps were in place but inspectors may not have identified them.
- Lamps burned out, and were not replaced,
- Lamps were removed by the property owner or tenant because they did not meet the needs of the tenant, or
- Lamps were removed by the tenant because they were relocating

Each of these reasons suggests different solutions for improving lighting retention, so below we offer specific recommendations as to how the program can improve the situation. As is explained in more detail in the On-Site Assessment Chapter, information is not available to quantify exactly which reasons are responsible for the lamps that were not found. There is some anecdotal information to suggest the relative importance of each of these reasons. There are a number of recommendations for future evaluations that will help quantify to what degree each of these issues is responsible for the missing lamps. These suggestions are included along with other recommendations provided below.

Improving lamp lifetime reliability. From the property manager surveys and discussions with contractors, it appears that the most important reason for lamps being removed is that the lamps are not achieving the expected lifetimes. This is an unexpected and troubling development; a solution to which extends way beyond the purview of this program. The program relies on the Energy Star label as the specification standard for lamps and fixtures. Though the Energy Star rating originally covered only the energy efficiency of the lamps, Energy Star has just recently been forced to delist some lamps because their reliability is below the expected lifetime range.[19] Energy Star is using the Program for the Evaluation and Analysis of Residential Lighting (PEARL) to help delist poor quality product. However, PEARL is currently only examining

[19] In report dated February 11, 2004, EPA delists 30 lamps effective March 11, 2004.

lamps sold at retail outlets and not those sold directly to contractors, which constitute most of the lamps installed in the MFRP. The MFRP program acted quickly to not permit any delisted lamps to receive rebates in the future. Unfortunately, the existence of less reliable product will continue to exist especially given the influx of imported lamps, and no specification standard or list exists that completely eliminates lamps with poor reliability.

Thus, the MFRP cannot be responsible for ensuring that all lamps purchased are reliable. This is the responsibility of the contractors and the manufacturers who supply them the product. Furthermore, the results of this on-site inspection and property manager survey may have been the first indication to the program and many of the contractors that lamp reliability was a serious issue.

Since disseminating these results in the fall of 2003, the evaluators have seen a number of encouraging developments taken by the program managers and the contractors to deal with the reliability issue.

- Several of the largest contractors contacted all of the properties they had served and agreed to replace lamps that have prematurely burned out.
- Some contractors have begun giving additional lamps to use as replacements for lamps that have burned out.
- The Program Managers have met with the largest contractors to discuss the lamp retention issue.

Further development of these types of efforts are encouraged. While evaluations such as this can provide feedback to the contractors and the program about lamp reliability, it should really be the responsibility of the property managers to convey reliability issues to contractors, and contractors who take these issues to their suppliers. Yet, in the current arrangement, the property managers are ill informed about their responsibility, and not empowered to add any quality assurance assistance to the overall effort. MFRP can facilitate a more positive relationship between the property managers, contractors, and suppliers in the following ways.

- **Prepare a short manual for property managers that explains the program**. Greater attention must be given to the role that property managers can play in this program. Guidance that helps property managers select contractors and sign off on equipment installations would be very helpful in improving program quality. Several of the utilities are now mailing copies of the California Contractors State License Board publication "What You Should Know Before You Hire a Contractor." This is an excellent program enhancement. There is also a need for information specific to this program. The manual should outline the responsibilities and choices the property manager assumes in agreeing to participate. It should also explain the contractor's responsibilities and which channels to use to deal with possible problems. Specifically, property managers need to know that they and not the utilities have full responsibility for choosing the contractor and accepting their work. Contractors should give prospective property managers the manual, or utilities can mail the manual when the reservation is made. The manual should also be available upon request and available on the utilities' web pages. As part of the application, property managers should sign that they received this manual and understand the responsibilities they assume by accepting the rebate.

- **Build awareness of product warranties and enforce product warranties**. The biggest incentive for contractors to install quality products is to avoid costly returns for replacement or repair. The program needs to leverage existing product warranties by educating the property owners/landlord to require that contractors fix any products they install that fail before the warranty is completed. If possible, language stating this should be part of the application. If not, the brochure above should include language property managers can add to their agreements/work orders they negotiate with their contractors. The brochure should instruct property managers that while the utility assumes no responsibility for the contractors, the utilities would like to hear from property managers if problems with contractors arise.

- **Require information on both fixture and lamp type for each application**. Contractors have reported that some problems appear to stem from a batch of lamps with high failure rates from one manufacturer. Because these data are not collected, the evaluation team cannot verify this claim. If this data were available, the utilities could closely monitor lamp issues at sites where these lamps are installed.

Lamp/fixture quality issues. Shorter than anticipated lamp lifetimes, however, is only one of the causes of the lamp removals. Our surveys and interviews revealed that some landlords and tenants removed lamps because the lighting quality or the fixture aesthetics were inadequate. When users complain about the quality of a lamp, they are most often complaining about the lighting level, though complaints may also reflect the color effects or lamp flickering. There were also concerns voiced about the aesthetic qualities of the fixtures and the sloppiness of the installations. The MFRP cannot institute any policy that can control these types of quality issues. It has to be the responsibility of the property managers to control these issues. Unfortunately, the property managers do not understand the issues involved in selecting lamps and fixtures, they are unaware of the various options available, and they are unaware that they have some choices in the types of product that can be installed in their apartments. Again the following recommendation can be done by MFRP to address lamp quality issues.

- **The manual for property managers should explain the choices that they can make in what equipment gets installed**. The manual should show the types of lamps/fixtures available, what wattage to choose, and other lighting issues.

- **Contractors whose work is tied to low participant satisfaction levels should be monitored closely**. If quality issue continue to be a big issue, then it may be necessary to move to greater control of contractors, and away from the rebate model. At that point, the use of performance bonds, withholding of portion of payment, and/or delisting of contractors who continue to have issues may be needed.

Lamps removed when tenant relocates. Property managers indicate that tenants leaving the properties took some of the missing lamps. Lamps that are removed and placed in new locations in the same utility continue to save the utility energy, though tracking this type of movement is difficult. The evaluations in the future should determine when lamps have been removed by relocating tenants and try to determine a new location for the tenant. However, if the tenant

removal issue is significant, it may suggest that MFRP should rely more on fixtures, and less on screw-in lamps.

Lamps were never installed. The best way to ensure that lamps have been installed is to increase the number of utility-conducted in-field inspections of program rebate applications. These verifications confirm that measures are installed. These inspections are in addition to the applicants supplying invoices for the purchase of measures.

- In 2002, PG&E and SCE perform in-field inspections on approximately 5% of their rebate applications. These inspections should increase to include all applications over a certain number of measures and all large dollar-value rebate items. A higher percentage of the remaining applications should also be in-field inspected. This will reduce the chances of rebates being granted for measures that are not installed or removed soon after. Even though the on-site survey did not find clear evidence of this occurring, it is a possibility.
- SDG&E and SCG perform in-field verifications of 100% of their applications. SDG&E does this level of verification because they have found that at least 10% of the equipment is not installed.

Lamps were installed but inspectors could not find them. Clearer protocol need to be developed and adhered to to confirm that all sites pre-selected for inspection are in fact observed. Future evaluations will need a tighter set of protocols to eliminate this as an issue. In addition, future evaluations need to address retention issues for lighting measures uncovered during this evaluation. It is recommended that resources be allocated to perform the following:

- Conduct telephone interviews with tenants receiving CFLs in their apartments to more accurately determine the disposition of the CFLs and assess the tenants' satisfaction with these lamps,
- Conduct more surveys with property managers to understand better the disposition of CFLs and fixtures installed under the program.

9.2 Restrict Lamp Installation to High Use Applications

In PY2002, there were no restrictions on where or how many lamps could be installed in a unit. Contractors installed lamps in closets and other low use applications. Starting in PY2004, contractors can no longer install lamps in low use areas or install an unlimited number of lamps in an apartment.

- The program should monitor lamp installations to ensure lamps are being installed in applications that collectively will average to the deemed savings assumption on lamp run times.

9.3 Increase Program Funds

One of the biggest issues confronting this program is over-demand, which forces electric funds to be fully subscribed within weeks of the program opening. If the quality control issue is resolved, there is significant justification for increasing program funding, particularly as a resource acquisition endeavor. Replacing inefficient lighting in tenant spaces is a large untapped potential market with almost no free ridership.

9.4 Adjust Rebate Levels

Because the money is so quickly committed, there is pressure to lower the level of rebate per fixture so that more units can be installed. The PY2004 program lowers the fixture rebate from $60 to $50. Not surprisingly, existing contractors objected to this rebate change, and some felt that the change would make it unprofitable to install the fixtures. The evaluation team's concern is that the lowered rebates will, at the very least, squeeze the profit margins of these contractors. In turn, this pressure may encourage contractors to use lower quality products. Unless a system of quality control is implemented, the results could be worse than experienced in PY2002.

- **The program managers must closely monitor activity at the beginning of PY2004 to track both application rates and the types of lamps being installed**. Program managers should recognize that it might take longer for contractors to find willing properties. Program managers must allow time for the program to work. A few successful contractors are all it will take to overcome the complaints of those who cannot adapt. The program managers are reminded that if applications are seriously lagging, it will only require a few weeks at the old incentive levels to fully subscribe the program again.

- **Contractors should be encouraged to see the reduction of incentives not as a call for lower quality equipment or less profit, but as a shift in program responsibility that requires property owners to help pay for these improvements**. Again, this will be more difficult than giving away free lamps, but there are property owners willing to receive an 80% discount on new equipment who can be targeted. This more difficult sell created by lowered program incentives may actually encourage contractors to push those lamps with better aesthetic and performance qualities in order to make the transaction more appealing to property owners. This should be monitored during the evaluation of the PY2004 program. During 2004, it will also be important that the program monitor any negative effects of altered incentive levels, including monitoring application locations to determine if the co-pay cost is limiting applications from HTR areas.

9.5 Create an Electronic Application

One of the most frequent suggestions from participating contractors was to make it possible to enter application data into some form of electronic application. It is hoped that an electronic process might eliminate or reduce some of the duplicative information entry now necessary for projects installing large multiples of the same measure in a site or large numbers of measures in

one location. The PG&E electronic data entry arrangement is well regarded among those who have used it. Contractors felt that this electronic form offers a good model for the other utilities.

There was also some feedback from contractors that the application process would be onerous for some property owners to complete. As the program increasingly reaches out to the property owners directly, this aspect should be examined to ascertain whether program application procedures are responsive to the needs of owners as well as contractors.

9.6 Market for Gas Applications

The lower interest in gas measures continues to be a concern for program managers who have stepped up marketing to potential customers and contractors. Because gas measures generally represent technologies that are incremental improvements over existing products, the utilities cannot offer rebates that cover the full installation cost. Unlike the electric lighting measures, where rebates often cover the full cost of the product and installation, lower gas rebate levels generally limit the applications to replacements. To achieve full commitment of gas funds, the program needs to tap into the existing large replacement market by aggressively marketing this program to property managers, contractors, and product distributors.

Program marketing is going to need to tackle the fact that quite a few contractors in the gas markets feel that higher incentives are needed in MFRP. These contractors see a customer base in the multifamily sector that is very first cost sensitive, and the contractors themselves are aware of apparent discrepancies in incentive levels across and within programs. Promotional messages will need to tackle these issues head on to win over some of the contractors now sitting on the sidelines in relation to this program. Some trades, such as plumbers, feel that the present rebate levels do not provide enough incentive to make it worthwhile to promote the program.

Program promotion will also clearly need to address marketing and outreach to the property owners as well as the contractors. Our research with contractors as well as survey data from property owners both suggested that there might be particular value in improving awareness among middle size property managers. Managers of larger properties were characterized as being more informed about their options as well as being more knowledgeable of the MFRP and its scheduling and requirements. For less sophisticated property managers, there was a perception that information on both the program and qualifying measures was needed in the market.

Effective gas programs operating elsewhere in the country appear to offer services that are more comprehensive. These services include technical review and advice, incentives in the form of cash rewards and sometimes reduced rate financing, and facilitation of customer access to other funds. Additional services may include coordinating participants' access to other services within the sponsoring organization, employing current analytical tools to assist property owners in understanding opportunities for saving energy, and providing support as needed for the implementation of recommendations during the construction process.

Several programs in other states find distributors and suppliers to be very effective in providing customers and contractors with good information and design support. Some programs are

working with suppliers to bring manufacturers' representatives to contractor meetings to ensure that contractors learn the advantages of new equipment and learn best practices for installing and maintaining this equipment. Other training providers are meeting key needs to improve the building and equipment maintenance skills of owners' and managers' staff. It should be noted, however, that some of the building operator training and certification courses are too extensive for multifamily building management staff.

9.6.1 Recommendations for Gas Measures

Based upon the findings above, the following recommendations are offered regarding marketing to promote qualifying gas measures.

- **The gas element of the MFRP should be structured to target replacement decisions rather than retrofit decisions.** In contrast with lighting measures, where the costs of retrofitting an existing system can be very cost-effective from the consumer's perspective, the cost of retrofitting an existing water heater or boiler is often prohibitive. The consumer typically defers replacement until such time as the unit fails or has reached the end of their useful life. Providing incentives to encourage early retirement of these units would be very costly and incentives are usually too low for this type of market activity to occur. Gas efficiency incentives are therefore most relevant to consumers at the time of equipment replacement. Importantly, the design of programs that target replacement opportunities is fundamentally different from programs that target retrofit opportunities.

- **To influence replacement decisions, the programs will likely need to increase marketing efforts with property managers, contractors, and distributors**. Even if the gas market remains limited to equipment replacement opportunities, there are enough replacements every year in the utility service territories to fill each utility's gas-measure goals. The program suffers from low awareness by property managers and contractors. Even those aware do not have enough information to quickly decide to participate when a decision about equipment replacement must be made. This report suggests numerous avenues for building awareness and access to needed applications and information. One essential recommendation is the need to market the program more extensively. With the exception of SCG, virtually no funds were expended in 2002 for marketing purposes.

- **Potential areas of focus for the gas element of the multifamily program are as follows:**
    - Developing a marketing plan for small- and medium-sized buildings,
    - Reviving relationships with distributors and suppliers as a means of reaching customers and contractors with information on new technologies, products, and program services,
    - Encouraging distributors/suppliers to work with equipment manufacturers to provide contractors with best practices training on new equipment, and
    - Supporting training at an accessible level for building maintenance staff on the important aspects of operating and maintaining new, energy efficient equipment.

9.7 Findings and Recommendations with Respect to HTR

- **The program should concentrate on its primary HTR goal of including multifamily and mobile home customers in the list of recipients of Public Goods Charges (PGC).** The emphasis on secondary goals detracts from the all-important goal of reaching multifamily units. Reaching the multifamily market is a worthy goal in itself, as this segment has long been underserved. The MFRP is one of the first programs that bring any type of program benefits to the tenants in these complexes, and as such, the goal should be reaching the broadest possible market of multifamily customers.

- **The program should stop concentrating attention in rural areas.** Promoting the program in rural areas is counterproductive. The analysis above shows the problems that a single program encounters when it individually tries to address all HTR issues simultaneously. The MFRP cannot cost-effectively and efficiently deliver a multifamily program targeted to rural areas because this is not where the bulk of the multifamily households exist. As the program continues, it will be increasingly more difficult to find non-participant multifamily complexes in these areas.

- The program's goal should be to push into areas where there has been little activity and great potential for cost-effectively and efficiently targeting multifamily units. The geographic information system (GIS) is used to identify specific census tracts where large numbers of potential candidates are located. This is defined as areas with more than 250 multifamily households and larger than average numbers of families in the moderate-income range (>32%). Most of these tracts had no program activity in 2002.

- **The Program needs to use Census Tract-level data for identifying HTR clusters.** Using zip codes for targeting program emphasis is too crude in most cases: The utilities set their original target priorities by selecting a set of zip codes to include as HTR areas. In most cases, the zip code level is too aggregated of spatial measure to identify accurately HTR households from non-HTR households

- **HTR Achievement Must Be Assessed at the Portfolio Level**. The current CPUC emphasis of setting goals for individual programs and measuring achievement at the program level should be reassessed. The real measure of success must be how well the overall portfolio of programs reaches all segments of the population. Three important concepts are missing from the current CPUC policy approach.

    - To reach HTR sub-groups effectively will require programs tailored to attract that specific group. These programs will not be universally applicable to the broader set of utility customers. If the group reached by the program is indeed HTR, then the program is effective.
    - Each utility's accountability in addressing HTR should be assessed at the aggregate level and not by individual programs. The utilities themselves may set HTR for each program manager, but those goals should be drawn to bring the entire portfolio into compliance and not to try to make every program HTR neutral. Each utility should be developing a portfolio of programs that fairly

distributes PGC funds across the entire class of customers. A good portfolio may contain some programs that are not very attractive to the HTR groups (new construction for example); as long as there are others included that specifically target these groups. Assessing each program individually ignores the purposeful targeting that is needed. In fact, as is the case here, it discourages programs from identifying underserved niches and marketing to them directly. Broad HTR goals applied across all programs individually will not create the type of targeted programs that will be most effective.

- There should be a balance between requiring each program to have a HTR goal and having programs exclusively designed for HTR. While in some program cases, it will be cost effective to serve HTR and non-HTR segments together due to economies of scale, in other cases programs may need to be specially designed for HTR. It may even be that such exclusive programs may be piggybacked on existing general population program.

- **Data on participation should be collected and assessed to design programs and redefine the exact composition of those who are HTR**. The analysis demonstrated here will give utilities important information on the distribution of benefits across customers in their service territories. As these data become available, it is important that the definitions of HTR be refined to reflect the reality of who is and who is not participating. Over time and with better data, the CPUC and the utilities will be better able to define the HTR segments so that what now may be "all multifamily" may eventually be "moderated income, non-white occupied units," or units in specific census tracts. As the group is better defined, so too should the program design and marketing become more specific in its reach to these audiences.

10. APPENDIX A: PROPERTY MANAGER SURVEYS

ICR
53 West Baltimore Pike
Media, Pennsylvania 19063-5698

Job #8674
July 23, 2003

INTERNATIONAL COMMUNICATIONS RESEARCH

Multifamily Property Manager Survey – Participating PMs

Recruitment
Hello I am _____ from International Communication Research, and I am interviewing property owners and managers as part of an evaluation of the 2002 (UTILITY NAME) multifamily rebate program. Your input will help (UTILITY NAME) improve the program.

The rebate program offered items such as outdoor lighting, indoor lighting, appliances, heating and cooling equipment, insulation, etc.

Screening

S1. Do you recall participating in this program and receiving improvements for your property at (ADDRESS FOR SAMPLED PROPERTY)?

1 Yes
2 No (ASK TO SPEAK TO SOMEONE WHO WOULD BE FAMILIAR)
R Refused (TERMINATE)

When answering the following questions, please refer to what was accomplished in the property at (ADDRESS FOR SAMPLED PROPERTY).

1. Initial Interest in Program

1.1. Do you recall how you first learned about this program?
(DO NOT READ LIST. ACCEPT ONE ANSWER)

1 Received information about program from the utility brochure
2 Received information from a bill stuffer
3 Read about program on Utility Company Web page
4 Contacted by a contractor offering services
5 Read about program in the newspaper
7 Other (PLEASE SPECIFY) _____
D Don't Know
R Refused

1.2 Do you recall seeing any of the following information about the program?

1 Yes
2 No
D Don't Know
R Refused

(ONLY ASK FOR THOSE NOT MENTIONED IN Q.1.1)
a. Brochures
b Bill stuffers
c. Web pages

1.3 (OMIT FOR PARTICIPANTS)

1.4. Which of the following features interested you in this program?
(READ LIST; ENTER ALL THAT APPLY)

(ROTATE 1-5)
1 The opportunity to reduce energy costs
2 The opportunity to receive a rebate on measures installed
3 Being able to upgrade the building
4 Being able to upgrade tenant units
5 The types of improvements available
N (DO NOT READ) None of these
D (DO NOT READ) Don't Know
R (DO NOT READ) Refused

2. Measures Installed and Decision-making

2.1 The program offers energy efficiency measures for both common areas and tenant units. Our records indicate that you installed the following measures….

(INSERT COMMON MEASURES FROM SAMPLE)
(INSERT TENANT MEASURES FROM SAMPLE)

Were those measures installed in the common areas only, tenant-occupied spaces only, or both?

1 Common areas only
2 Tenant-occupied spaces only
3 Both
D Don't know
R Refused

(IF Q.2.1 = 1 OR 3, ASK Q.2.2; OTHERWISE SKIP TO INSTRUCTION BEFORE Q.2.6)

For measures installed in common areas…

2.2 The next set of questions is for measures you have installed in common areas. Was the cost of this installation an issue that you assessed in making your decision to have measures installed in common areas?

1 Yes
2 No (SKIP TO Q2.5)
D Don't Know (SKIP TO Q2.5)
R Refused (SKIP TO Q2.5)

2.3 (OMITTED FOR PART.)

(IF YES IN Q2.2, ASK:)
2.4. Which of the following best characterizes the way in which you assessed the cost of this investment in the common area? (READLIST; ACCEPT ONE RESPONSE)

1 Looked at the total cost of the installation
2 Looked at the total cost relative to the energy savings you were told to expect
3 Looked at the number of years that the investment would take to pay for itself
4 Looked at the return on investment
5 Would not need to judge because the cost would be minimal
7 Other (PLEASE SPECIFY) _____
D (DO NOT READ) Don't know
R (DO NOT READ) Refused

2.5. What other factors, besides investment costs, did you consider in deciding to have these measures installed in the common areas? (DO NOT READ LIST. ENTER ALL THAT APPLY)

1 Repair, maintenance issues
2 Installation difficulties
3 Quality of product
4 Tenant acceptance, aesthetics
5 2005 Deadline
7 Other (SPECIFY) _____
N None, no other factors
D Don't know
R Refused

(IF Q.2.1 = 2 OR 3, ASK Q.2.6; OTHERWISE SKIP TO 2.9)

For measures installed in tenant areas…

2.6. The next set of questions is for measures you have installed in tenant-occupied spaces. Was the cost of this installation an issue that you assessed in making your decision to have measures installed in tenant spaces?

1 Yes
2 No (SKIP TO Q2.8)
D Don't Know (SKIP TO Q2.8)
R Refused (SKIP TO Q2.8)

(IF YES, ASK)

2.7. Which of the following best characterizes the way in which you assessed the cost of this investment in tenant spaces? (READ LIST. ACCEPT ONE RESPONSE.)

1 Looked at the total cost of the installation
2 Looked at the total cost relative to the energy savings you were told to expect
3 Looked at the number of years that the investment would take to pay for itself
4 Looked at the return on investment
5 Did not need to assess because the cost was minimal
7 Other (PLEASE SPECIFY) _____
D (DO NOT READ) Don't know
R (DO NOT READ) Refused

2.8. What other factors, besides investment costs, did you consider in deciding to have these measures installed in tenant spaces? (DO NOT READ LIST. ENTER ALL THAT APPLY.)

1 Repair, maintenance issues
2 Installation difficulties
3 Quality of product
4 Tenant acceptance, aesthetics
5 2005 Deadline
7 Other (SPECIFY) _____
N None, no other factors
D Don't know
R Refused

(ASK EVERYONE)

2.9. Now, thinking of all the measures taken, including yourself, who was involved in this decision?
(READ LIST, ENTER ALL THAT APPLY)

1 Property owner
2 Property manager
3 Supervisor at property management company
4 Purchasing manager at property management company
5 The Board
7 Other (PLEASE SPECIFY) _____
D Don't Know
R Refused

2.10. How many bids did you seek for this work?
(SELECT ONE)

1 One bid
2 2 bids
3 3 bids
4 4 or more bids
7 Other (PLEASE SPECIFY) _____
N None/no bids sought
D Don't Know
R Refused

2.11. Did you request a list of contractors working with this program from the utility?

1 Yes
2 No
3 List was provided/offered
D Don't Know
R Refused

2.12 What difficulties, if any, were encountered with the project?

1 Answer given
N None, no difficulties
D Don't know
R Refused

3. Satisfaction with Program and Measures Installed

3.1A. On a scale of 1 to 5, with 1 being "not at all satisfied" and 5 being "extremely satisfied," how satisfied are you with the overall quality of the work completed by the contractor?

5	Extremely satisfied	(SKIP TO Q.3.1B)
4		(SKIP TO Q.3.1B)
3		(CONTINUE TO Q. 3.1AA)
2		(CONTINUE TO Q. 3.1AA)
1	Not at all satisfied	(CONTINUE TO Q. 3.1AA)
D	Don't know	(SKIP TO Q.3.1B)
R	Refused	(SKIP TO Q.3.1B)

(IF RATING IS 3 OR LESS, ASK:)
3.1AA. Why did you select that rating?

1	Equipment broke
2	The quality of the equipment was not up to our standards
3	The quality of the installation was not up to our standard
4	We did not like the way the product looked
5	The installers did not meet our standards
6	The job took too long
7	The installers were too disruptive, or messy
8	Other, specify
D	Don't know
R	Refused

3.1B. On a scale of 1 to 5, with 1 being "not at all satisfied" and 5 being "extremely satisfied," how satisfied are you with the Performance of the equipment installed by the contractor?

5	Extremely satisfied	(SKIP TO Q.3.2)
4		(SKIP TO Q.3.2)
3		(CONTINUE TO Q.3.1BB)
2		(CONTINUE TO Q.3.1BB)
1	Not at all satisfied	(CONTINUE TO Q.3.1BB)
D	Don't know	(SKIP TO Q.3.2)
R	Refused	(SKIP TO Q.3.2)

(IF RATING IS 3 OR LESS, ASK:)
3.1BB. Why did you select that rating?

1	Equipment broke
2	The quality of the equipment was not up to our standards

3 The quality of the installation was not up to our standard
4 We did not like the way the product looked
5 The lamps were too dim
6 The equipment makes too much noise
7 Other, specify
D Don't know
R Refused

(IF TENANT MEASURES, Q. 2.1 = 2 OR 3, ASK; OTHERWISE SKIP TO Q.3.3)

3.2. For installations in tenant units, on a scale of 1 to 5, with 1 being "not at all satisfied" and 5 being "extremely satisfied," how satisfied are your tenants with the equipment that was installed?

5	Extremely satisfied	(SKIP TO Q.3.2B)
4		(SKIP TO Q.3.2B)
3		(CONTINUE TO Q.3.2A)
2		(CONTINUE TO Q.3.2A)
1	Not at all satisfied	(CONTINUE TO Q.3.2A)
D	Don't Know	(SKIP TO Q.3.3)
R	Refused	(SKIP TO Q.3.3)

(IF RATING IS 3 OR LESS:)

3.2A. Why did you select that rating?

1 Equipment broke
2 The quality of the equipment was not up to our standards
3 The quality of the installation was not up to our standard
4 We did not like the way the product looked
5 The lamps were too dim
6 The equipment makes too much noise
7 The installers were too disruptive or messy
8 Other, specify
D Don't know
R Refused

(IF RATING IS 4 OR 5:)

3.2B. What do tenants like most about the work that was completed?

01 Reduced/lower energy bills
02 More comfortable/better cooling/heating
03 Style
04 Better quality
99 Other (SPECIFY)
DD Don't know
RR Refused

3.3. Overall, were your expectations from the program adequately met?

1 Yes (SKIP TO Q.3.4)
2 No
D Don't Know (SKIP TO Q.3.4)
R Refused (SKIP TO Q.3.4)

(IF NO, ASK:)
3.3A. Please explain why not.

1 Answer given
D Don't know
R Refused

3.4. Would you recommend this program to the property manager at another facility?

1 Yes (SKIP TO Q.4.1)
2 No (CONTINUE TO Q. 3.4A)
D Don't Know (SKIP TO Q.4.1)
R Refused (SKIP TO Q.4.1)

(IF NO, ASK:)
3.4A. Please explain why not.

1 Answer given
D Don't know
R Refused

4. Marketing

4.1. Which of the following are your preferred means of getting information about these types of programs from the utilities? (READ ENTIRE LIST. ACCEPT UP TO 3 ANSWERS)

01 Bill stuffers
02 Newspapers
03 Radio
04 TV
05 Utility website
06 Contractors or other vendors
07 Trade association (ASK Q.4.2)
08 Fax
09 E-Mail
10 Direct mail
NN (DO NOT READ) None of these
DD (DO NOT READ) Don't Know

RR (DO NOT READ) Refused

(IF CODE 07 – TRADE ASSOCIATION - IN Q.4.1, ASK; OTHERWISE SKIP TO Q.4.3)

4.2. Which trade associations that you belong to should your utility use to get information to you on current program offerings?

01 **Eastern Empire Apartment Owners and Managers Association**
02 Southern California Apartment Owners and Managers Association
03 Orange County Apartment Owners and Managers Association
99 Other (SPECIFY) _____
DD Don't know
RR Refused

(IF RESPONDENT MENTIONS MORE THAN ONE TRADE ASSOCIATION, ASK Q.4.2A)

4.2A. Which of those would be the best way to get information to you? (ACCEPT ONE ANSWER.) (PN: SHOW ONLY THOSE MENTIONED IN Q4.2)

01 **Eastern Empire Apartment Owners and Managers Association**
02 Southern California Apartment Owners and Managers Association
03 Orange County Apartment Owners and Managers Association

99 Other (SPECIFY) _____
DD Don't Know
RR Refused

5. Impacts and Recommendations for Improvement

5.1. Are you in a position to see the energy savings from the equipment installed through the Multifamily Rebate Program?

1	Yes	(CONTINUE TO Q.5.1A)
2	No	(SKIP TO Q.5.2)
D	Don't Know	(SKIP TO Q.5.2)
R	Refused	(SKIP TO Q.5.2)

(IF YES ASK; OTHERWISE SKIP TO 5.2)

5.1A. Have you seen decreases in your energy bills for the property at (SAMPLE ADDRESS)?

1	Yes	(CONTINUE TO Q.5.1B)
2	No	(SKIP TO Q.5.2)
D	Don't Know	(SKIP TO Q.5.2)
R	Refused	(SKIP TO Q.5.2)

(IF YES ASK; OTHERWISE SKIP TO 5.2)

5.1B. On average, what are the monthly savings as a result of the new equipment?

_____ (ENTER $ AMOUNT)
DD Don't know
RR Refused

5.2. Have any tenants told you that they have seen decreases in their energy bills?

1 Yes
2 No
3 Tenants were not affected
D Don't Know
R Refused

(IF HVAC/INSULATION = "TRUE", ASK; OTHWISE SKIP TO 5.4)

5.3. Have any tenants commented on being more or less comfortable since the HVAC or insulation measures were installed?
(ACCEPT ONE ANSWER)

1 More comfortable
2 Less Comfortable
3 About the same
4 Tenants have not commented
5 No HVAC/Insulation measures installed
D Don't Know
R Refused

(IF HARDWIRE = "TRUE", ASK; OTHERWISE SKIP TO 5.5)

5.4. Have any tenants commented on being able to see better or less well since the lighting measures were installed?
(ACCEPT ONE ANSWER)

1 Better
2 Less
3 About the same
4 Tenants have not commented
5 No HVAC/Insulation measures installed
D Don't Know
R Refused

5.5. Had you installed any energy efficiency improvements prior to participating in this program?

1 Yes
2 No (SKIP TO Q.5.6)

D Don't Know (SKIP TO Q.5.6)
R Refused (SKIP TO Q.5.6)

(IF YES, ASK:)
5.5A. What energy efficiency improvements had you installed? What others?

01 Hard-wired Fluorescent Fixtures
02 Hard-wired Fluorescent porch/outdoor lights
03 Screw in Compact Fluorescent Lamps (CFLs)
04 Energy Star ceiling fans
05 Energy Star clothes washers
06 Energy Star Dishwashers
07 Energy Star programmable thermostats
08 High performance dual-paned windows
09 Attic or wall insulation
10 High efficiency exit signs
11 Occupancy Sensors
12 Photocell controls for exterior lighting
13 High efficiency boilers
14 High efficiency water heaters
15 High efficiency air conditioners or heat pumps
16 Natural gas water heater or boiler controllers
17 Solar water heating
18 Solar photovoltaic (PV) panels
19 Cool roofs
97 Other (SPECIFY) _____
DD Don't know
RR Refused

5.6. Do you have any plans to make any energy efficiency improvements to this or other properties in the next two to three years?

1 Yes
2 No (SKIP TO Q.5.7)
D Don't Know (SKIP TO Q.5.7)
R Refused (SKIP TO Q.5.7)

5.6A. What energy efficiency improvements do you plan to install in <u>Tenant-occupied Spaces</u>?
(DO NOT READ; TAKE ALL THAT APPLY)

01 Compact Fluorescent Lamps (CFLs)
02 Hard-wired fluorescent fixtures
03 Energy Star ceiling fans
04 Energy Star Clothes Washers
05 Energy Star Dishwashers
06 Energy Star Programmable Thermostats

07 Energy Star Refrigerators
08 High efficiency window or through-wall air conditioners
09 High performance dual-paned windows
10 Attic or wall insulation
97 Other (SPECIFY) _____
NN None in Tenant-occupied spaces
DD Don't know
RR Refused

5.6B. What energy efficiency improvements do you plan to install in Common Areas? (DO NOT READ; TAKE ALL THAT APPLY)

01 Compact Fluorescent Lamps (CFLs)
02 Hard-wired Fluorescent Indoor lighting
03 Hard-wired Fluorescent or high efficiency outdoor lighting
04 Energy Star Coin-operated clothes washers
05 High efficiency Furnaces
06 High efficiency Central Boilers
07 High efficiency Water Heaters
08 High efficiency Air Conditioning
09 Attic or wall insulation
10 High efficiency exit signs
11 Occupancy sensors for interior lighting
12 Photocell controls for exterior lighting
13 Natural gas water heater or boiler controllers
14 Solar water heading
15 Solar photovoltaic (PV) panels
16 Cool roofs
97 Other (SPECIFY) _____
NN None in Common Areas
DD Don't know
RR Refused

5.7. Would you be interested in incentives that encouraged replacement of Refrigerators?

1 Yes
2 No
D Don't Know
R Refused

5.8. Would you be interested in incentives that encouraged replacement of Coin operated clothes washers?

1 Yes
2 No
D Don't Know
R Refused

Other

6.1. How many apartment units are located in the building or buildings at the address we have been talking about? (PROMPT. That is at: (SAMPLE ADDRESS)?

_____ (RECORD # UNITS)
DD Don't Know
RR Refused

6.2. How many stories is the building(s) at (INSERT SAMPLE ADDRESS)?

_____(RECORD # STORIES)
DD Don't Know
RR Refused

6.3. Do you, or your firm own this property, manage it, or both own and manage? (ACCEPT ONE ANSWER)?

1 Own only
2 Manage only
3 Own and manage
R (DO NOT READ) Refused

6.4. In total, how many multifamily residential properties in California do you, or your firm:

a. Own and manage?
_____ (RECORD #)
DD Don't Know
RR Refused

b. Own but do not manage?
_____ (RECORD #)
DD Don't Know
RR Refused

c. Manage only?
_____ (RECORD #)
DD Don't Know
RR Refused

6.5. How many years have you been in your current position at this property?

_____(RECORD # YEARS)
DD Don't Know
RR Refused

6.5B. How many years have you been in the multifamily ownership and management business?

_____(RECORD # YEARS)
DD Don't Know
RR Refused

6.6. We have just one more question. Based on your experience, what suggestions do you have for improving the Multifamily Rebate Program?

1 Answer given
N None/no suggestions
D Don't know
R Refused

Thank you very much for participating in this survey. Would you like to have (UTILITY NAME) send you information about energy efficiency programs currently available to Multifamily Property Managers?

1 Yes
2 No

(IF YES, VERIFY NAME AND ADDRESS FOR MAILING.)

ICR
53 West Baltimore Pike
Media, Pennsylvania 19063-5698

INTERNATIONAL COMMUNICATIONS RESEARCH

Job #8674
July 25, 2003

10.1.1.1.1.1 MF Property Manager Survey – Nonparticipating PMs

Introduction

Hello I am _____ from International Communication Research. We are conducting a study on behalf of the California utilities in order to understand why landlords participated or did not participate in the 2002 Multifamily Rebate Program. The Rebate Program offered items such as outdoor lighting, indoor lighting, appliances, heating and cooling equipment, insulation, etc. Your input will help the California utilities make future rebate programs more useful to owners and managers of multifamily properties.

Screening

S1. First, are you an owner and/or manager of a multifamily property?

1 Yes
2 No (ASK IF THERE IS ANOTHER PERSON AT THIS LOCATION WHO IS A MULTIFAMILY PROPERTY OWNER OR MANAGER AND REREAD THE INTRODUCTION. IF NONE, TERMINATE)
D Don't Know (TERMINATE)
R Refused (TERMINATE)

S2. And how many of the buildings that you manage or own have five or more units?

_____ (ENTER # OF BUILDINGS)
(IF NONE, DK OR REF – TERMINATE)

(IF ONE BUILDING IN S2: When answering the following questions, please refer to this building.)
(IF MORE THAN ONE BUILDING IN S2: When answering the following questions, please refer to the building with five or more units that you most actively manage.)

S3. Did you participate in the 2002 Multi Family Rebate Program which provides incentives for installing energy efficient measures in multifamily properties?

1 Yes (TERMINATE)
2 No
D Don't Know
R Refused

1. Non-participant Program Awareness

1.1. Are you aware of the Multifamily Rebate Program which provides incentives for installing energy efficient measures in multifamily properties?

1 Yes
2 No (SKIP TO Q.1.3)
D Don't Know (SKIP TO Q.1.3)
R Refused (SKIP TO Q.1.3)

(IF YES IN Q.1.1, ASK; OTHERWISE SKIP TO 1.3)

1.1A. Do you recall how you first learned about this program? (DO NOT READ LIST. ACCEPT ONE ANSWER)

1 Received information about program from the utility brochure
2 Received information from a bill stuffer
3 Read about program on Utility Company Web page
4 Contacted by a contractor offering services (SKIP TO Q.1.2)
5 Read about program in the newspaper (SKIP TO Q.1.2)
7 Other (PLEASE SPECIFY) _____ (SKIP TO Q.1.2)
D Don't know/Don't recall (SKIP TO Q.1.2)
R Refused (SKIP TO Q.1.2)

(IF CODES 1, 2 OR 3, ASK Q.1.1B; OTHERWISE SKIP TO Q1.2)

1.1B From which utility did you see information? (DO NOT READ LIST. ENTER ALL THAT APPLY)

1 Los Angeles Water & Power (LAWP)
2 Pacific Gas & Electric (PG&E)
3 Sacramento Utility District (SMUD)
4 San Diego Gas & Electric (SDG&E)
5 Southern California Edison (Edison or SCE)
6 Southern California Gas (SoCal Gas)
D Don't know
R Refused

1.2 Do you recall seeing any of the following with information about the program?

1 Yes
2 No
D Don't Know
R Refused

(ONLY ASK FOR THOSE NOT MENTIONED IN Q.1.1A)

a. Brochures
b. Web pages
c. Bill stuffers

1.3 This program offers rebates for multifamily property managers who work with contractors to install a variety of energy-savings measures, including such things as high efficiency lighting, appliances, water heaters and boilers.

1.4 Which of the following features would interest you in this program?
(READ LIST; ENTER ALL THAT APPLY)

(ROTATE 1-5)
1 Opportunity to reduce energy costs
2 Opportunity to receive a rebate on measures installed
3 Being able to upgrade the building
4 Being able to upgrade tenant units
5 Types of improvements available
N (DO NOT READ) None of these
D (DO NOT READ) Don't Know
R (DO NOT READ) Refused

1.5 What questions would you need to have answered before you agreed to participate in a program such as this?
(DO NOT READ; ENTER ALL THAT APPLY)

01 What is the cost of the installation?
02 How much will the utility bills go down as a result of the installation?
03 How do I participate?
04 What paperwork is required or what forms do I need to fill out?
05 What rebate will I receive?
06 How long will it take to get paid?
07 Are the lights, appliances and other equipment good quality?
08 Do the contractors in the program do quality installation work?
97 Other (SPECIFY) _____
NN None
DD Don't Know
RR Refused

2. Decision-making

2.1. Which of the following measures do you think you would be interested in installing in your tenant-occupied spaces? (READ LIST. ENTER ALL THAT APPLY)

01 Hard-wired Fluorescent Fixtures in tenant spaces with rebate of $60 per fixture
02 Hard-wired Fluorescent porch lights with rebate of $30 per fixture
03 Screw in Fluorescent lamps with a rebate of $2 per lamp

04 Energy Star ceiling fans with a rebate of $20 per fixture.
05 Energy Star clothes washers with rebate of $75 per unit
06 Energy Star Dishwasher with rebate of $50 per unit
07 Energy Star programmable thermostats with a rebate of $20 per unit
08 High performance dual-paned windows with a rebate of $0.50 per square foot
09 Attic or wall insulation with a rebate of $0.15 per square foot
NN (DO NOT READ) None of the above
DD (DO NOT READ) Don't Know
RR (DO NOT READ) Refused

2.2. Which of the following measures do you think you would be interested in installing in your common areas? (READ LIST. ENTER ALL THAT APPLY)

01 High efficiency exit signs with a rebate of $4.50 per sign
02 Screw in Fluorescent lamps with a rebate of $2 per lamp
03 Occupancy Sensors with a rebate of $10 per sensor
04 Photocells with a rebate of $10 per cell
05 High performance dual-paned windows with a rebate of $0.50/ per square foot
06 High efficiency boilers with rebates up to $1,500 per unit
07 High efficiency water heaters with rebates up to $550 per unit
08 High efficiency air conditioners or heat pumps with rebates up to $500 per unit
09 Coin operated clothes washers
10 Natural gas water heater or boiler controllers with rebates up to $750 per unit
NN (DO NOT READ) None of the above
DD (DO NOT READ) Don't Know
RR (DO NOT READ) Refused

(IF Q2.1 = N/D/R AND Q2.2 = N/D/R, SKIP TO Q2.11)

2.3. Which of the items just mentioned would you be most likely to want to install? (ENTER ONE RESPONSE)
(SHOW ONLY THOSE SELECTED IN Q2.1 AND Q2.2)

(Tenant-Occupied Spaces)
01 Hard-wired Fluorescent Fixtures in tenant spaces with rebate of $60 per fixture
02 Hard-wired Fluorescent porch lights with rebate of $30 per fixture
03 Screw in Fluorescent lamps with a rebate of $2 per lamp
04 Energy Star ceiling fans with a rebate of $20 per fixture.
05 Energy Star clothes washers with rebate of $75 per unit
06 Energy Star Dishwasher with rebate of $50 per unit
07 Energy Star programmable thermostats with a rebate of $20 per unit
08 High performance dual-paned windows with a rebate of $0.50 per square foot
09 Attic or wall insulation with a rebate of $0.15 per square foot
(Common Areas)
11 High efficiency exit signs with a rebate of $4.50 per sign

12 Screw in Fluorescent lamps with a rebate of $2 per lamp
13 Occupancy Sensors with a rebate of $10 per sensor
14 Photocells with a rebate of $10 per cell
15 High performance dual-paned windows with a rebate of $0.50 per square foot
16 High efficiency boilers with rebates up to $1,500 per unit
17 High efficiency water heaters with rebates up to $550 per unit
18 High efficiency air conditioners or heat pumps with rebates up to $500 per unit
19 Coin operated clothes washers
20 Natural gas water heater or boiler controllers with rebates up to $750 per unit
NN (DO NOT READ) None of the above
DD (DO NOT READ) Don't Know
RR (DO NOT READ) Refused

2.4. For (ITEM CHOSEN IN Q2.3) Which of the following best characterizes the way in which you would assess the cost of this investment? (READ LIST. ENTER ONE RESPONSE)

(ROTATE 1-5)
1 Look at the total cost of the installation
2 Look at the total cost relative to the energy savings you were told to expect
3 Look at the number of years that the investment would take to pay for itself
4 Look at the return on investment
5 Would not need to judge because the cost would be minimal
7 Other (PLEASE SPECIFY) _____
D (DO NOT READ) Don't Know
R (DO NOT READ) Refused

2.5 What other factors, besides investment costs, would you consider in deciding to have this/these measures installed? (DO NOT READ LIST. ENTER ALL THAT APPLY.)

1 Repair, maintenance issues
2 Installation difficulties
3 Quality of product
4 Tenant acceptance, aesthetics
5 2005 Deadlines
7 Other (SPECIFY) _____
N None, no other factors
D Don't know
R Refused

2.6. Including yourself, who would be involved in this decision?
(READ LIST, ENTER ALL THAT APPLY)

1 Property owner
2 Property manager
3 Supervisor at property management company

4 Purchasing manager at property management company
5 The Board
7 Other (PLEASE SPECIFY) _____
D Don't Know
R Refused

2.7. How many bids would you seek for this work?

1 One bid
2 2 bids
3 3 bids
4 4 or more bids
7 Other (PLEASE SPECIFY) _____
N None/would not seek bids
D Don't Know
R Refused

2.8. Would you request a list of contractors working with this program from the utility?

1 Yes
2 No
D Don't Know
R Refused

2.9. What difficulties, if any, might you expect to encounter with the project?

1 Answer given
N None, no difficulties
D Don't know
R Refused

(SKIP TO Q4.1)

2.10. What is the major reason you have not selected any of the measures I read to you earlier? Is it because…(READ LIST)?

1 You are just not interested in participating in the utility program (GO TO Q2.11)
2 You are interested in the program, but none of the measures interest you (GO TO Q.2.12)
3 You are interested in the measures but the rebates are not big enough (GO TO Q4.1)
D Don't Know
R Refused

2.11. Why are you <u>not</u> interested in this utility program? Is it because…?
(READ LIST AND ENTER ALL THAT APPLY)

01 You have done all you can to save energy in your buildings
02 You have had bad experiences with previous utility programs
03 You do not see the investment of time and money as being worthwhile
04 You do not have time to devote to this program
05 Your energy costs do not constitute a large enough cost to warrant concern
06 You have no desire to make these investments in tenant spaces
07 You have already installed the eligible measures
97 Other (PLEASE SPECIFY) _____
DD (DO NOT READ) Don't Know
RR (DO NOT READ) Refused

(IF RESPONSE 07 CHOSEN IN 2.11, ASK 2.12; OTHERWISE GO TO Q4.1)

2.12. Are there other energy saving measures that you would be interested in if they were offered in this program? (IF YES:) What are they?

01 Energy Star refrigerators
02 Energy Star window or through-wall air conditioners
03 Energy Star coin-operated clothes washers
04 Solar domestic water heaters
05 Photovoltaic ("PV") panels
06 Cool roofs
97 Other (SPECIFY)
NN No, not interested
DD Don't Know
RR Refused

4. Marketing

4.1. Which of the following is your preferred means of getting information about these types of programs from the utilities? (READ ENTIRE LIST. ACCEPT UP TO 3 ANSWERS)

01 Bill stuffers
02 Newspapers
03 Radio
04 TV
05 Utility website
06 Contractors or other vendors
07 Trade association (ASK Q.4.2)
08 Fax
09 E-Mail
10 Direct mail
NN (DO NOT READ) None of these
DD (DO NOT READ) Don't Know
RR (DO NOT READ) Refused

(IF CODE 07 IN Q.4.1, ASK; OTHERWISE SKIP TO Q.4.3)

4.2. Which trade associations that you belong to should your utility use to get information to you on current program offerings?

01 Eastern Empire Apartment Owners and Managers Association
02 Orange County Apartment Owners and Managers Association
03 Southern California Apartment Owners and Managers Association
99 Other (SPECIFY)_____
DD Don't know
RR Refused

(IF RESPONDENT MENTIONS MORE THAN ONE TRADE ASSOCIATION, ASK Q.4.2A)

4.2A. Which of those would be the best way to get information to you? (ACCEPT ONE ANSWER.) (PN: SHOW ONLY THOSE MENTIONED IN Q4.2)

01 Eastern Empire Apartment Owners and Managers Association
02 Orange County Apartment Owners and Managers Association
03 Southern California Apartment Owners and Managers Association
99 Other (SPECIFY) _____
DD Don't Know
RR Refused

5. Past and Future Investments

5.1. Have you installed any energy efficiency improvements recently that were outside of any utility- or State-sponsored energy efficiency program?

1 Yes
2 No (SKIP TO Q.5.2)
D Don't Know (SKIP TO Q.5.2)
R Refused (SKIP TO Q.5.2)

(IF YES, ASK:)

5.1a. What energy efficiency improvements had you installed? What others?

01 Hard-wired Fluorescent Fixtures
02 Hard-wired Fluorescent porch/outdoor lights
03 Screw in Compact Fluorescent Lamps (CFLs)
04 Energy Star ceiling fans
05 Energy Star clothes washers
06 Energy Star Dishwashers
07 Energy Star programmable thermostats
08 High performance dual-paned windows
09 Attic or wall insulation

10 High efficiency exit signs
11 Occupancy Sensors
12 Photocell controls for exterior lighting
13 High efficiency boilers
14 High efficiency water heaters
15 High efficiency air conditioners or heat pumps
16 Natural gas water heater or boiler controllers
17 Solar water heating
18 Solar photovoltaic (PV) panels
19 Cool roofs
97 Other (SPECIFY) _____
DD Don't know
RR Refused

5.2. Do you have any plans to make any energy efficiency improvements to this or other properties in the next two to three years?

1 Yes
2 No (SKIP TO Q.5.3)
D Don't Know (SKIP TO Q.5.3)
R Refused (SKIP TO Q.5.3)

(IF YES, ASK Q's 5.2A AND 5.2B)

5.2A. What energy efficiency improvements do you plan to install in Tenant-occupied spaces? (DO NOT READ; ENTER ALL THAT APPLY)

01 Compact Fluorescent Lamps (CFLs)
02 Hard-wired fluorescent fixtures
03 Energy Star ceiling fans
04 Energy Star Clothes Washers
05 Energy Star Dishwashers
06 Energy Star Programmable Thermostats
07 Energy Star Refrigerators
08 High efficiency window or through-wall air conditioners
09 High performance dual-paned windows
10 Attic or wall insulation
97 Other (SPECIFY) _____
NN None in Tenant-occupied spaces
DD Don't know
RR Refused

5.2B. What energy efficiency improvements do you plan to install in Common Areas? (DO NOT READ; TAKE ALL THAT APPLY)

01 Compact Fluorescent Lamps (CFLs)
02 Hard-wired Fluorescent Indoor lighting
03 Hard-wired Fluorescent or high efficiency outdoor lighting

04 Energy Star Coin-operated clothes washers
05 High efficiency Furnaces
06 High efficiency Central Boilers
07 High efficiency Water Heaters
08 High efficiency Air Conditioning
09 Attic or wall insulation
10 High efficiency exit signs
11 Occupancy sensors for interior lighting
12 Photocell controls for exterior lighting
13 Natural gas water heater or boiler controllers
14 Solar water heading
15 Solar photovoltaic (PV) panels
16 Cool roofs
97 Other (SPECIFY) _____
NN None in Common Areas
DD Don't know
RR Refused

5.3. Would you be interested in incentives that encouraged replacement of Refrigerators?

1 Yes
2 No
D Don't Know
R Refused

5.4. Would you be interested in incentives that encouraged replacement of Coin operated clothes washers?

1 Yes
2 No
D Don't Know
R Refused

Other

6.1. How many apartment units are located in the building or buildings at the address we have been talking about (Prompt: that is at: (INSERT ADDRESS)?

_____ (RECORD # UNITS)
DD Don't know
RR Refused

6.2. How many stories is the building(s) at that address?

_____ (RECORD # STORIES)
DD Don't Know
RR Refused

6.3. Do you, or your firm own this property, manage it, or both own and manage? (ACCEPT ONE ANSWER)?

1 Own only
2 Manage only
3 Own and manage
R (DO NOT READ) Refused

6.4. In total, how many multifamily residential properties in California do you, or your firm:

a. Own and manage?
_____ (RECORD #)
DD Don't Know
RR Refused

b. Own but do not manage?
_____ (RECORD #)
DD Don't Know
RR Refused

c. Manage only?
_____ (RECORD #)
DD Don't Know
RR Refused

6.5. How many years have you been in your current position at this property?

_____ (RECORD # YEARS) ◄
RR Refused

6.5B. How many years have you been in the multifamily ownership and management business?

_____(RECORD # YEARS)
DD Don't Know
RR Refused

Thank you very much for participating in this survey. Would you like to have your utility send you information about energy efficiency programs currently available to Multifamily Property Managers?

1 Yes
2 No

(IF YES, ASK)

Which utility would you be interested in receiving information from?

1 Pacific Gas & Electric (PG&E)
2 San Diego Gas & Electric (SDG&E)
3 Southern California Edison (Edison or SCI)
4 Southern California Gas (SoCal Gas)
N None of these

(IF YES, VERIFY NAME AND ADDRESS FOR MAILING.)

11. APPENDIX B: ON-SITE SURVEY FORM

1. Is the building(s) master-metered? In other words, is there only one electric and/or gas meter for several tenants?

2. ***(Ask only if lighting installed)*** There have been several reported problems with the hard-wired fixtures and lamps. Have you experienced any problems?

3. ***(Ask only if yes to the above)*** How did you deal with this problem?
   - Replaced with incandescent lamp
   - Replaced with another lamp of same type
   - Replaced with new fixture (incandescent/fluorescent)
   - Other:

4. ***(Ask only if corrective work was done)*** Who performed the corrective work?
   - Property staff
   - Original contractor
   - Other contractor
   - Tenant
   - Other:

California MultiFamily Onsite Verification Form 1									
Utility:						Apartment Room Description		Common Area Room Descriptions	Field Survey Preformed by:
Application Number:						LR = Living Room DR = Dining Room		ComIn = Common Inside	Name:
Complex Type Listed:						FR = Family Room BD = Bedroom		Comout = Common Outside	Date:
Complex Type Found:						H/E = Hall/Entry P = Porch			
						Kit = Kitchen Bath = Bathroom O = Other			
Item #	Measure code	Location Listed	Location Found	Quantity Listed	Quantity Found	Room Description	If Common Area Lighting, Approximate Hours of Operation	If HVAC/Thermostat or Waterheater/Boiler, Make and Model Number	If HVAC, Approximate Area of Conditioned Square Footage
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									

California MultiFamily Onsite Verification Form 2	
Item #	Discrepancies and other comments

12. APPENDIX C: ON-SITE RECRUITMENT SCRIPT

Good Morning, may I speak to Mr./Mrs. _____?

My name is _____ and I represent ASW Engineering who is on contract to _____ [FILL IN APPROPRIATE UTILITY], your utility.

Last year, _____[FILL IN APPROPRIATE UTILITY], along with other utilities in the State of California conducted the Multifamily Energy Efficiency Rebates Program whereby certain energy efficiency products were rebated and installed in residential multifamily complexes.

The utilities are required to verify the effectiveness of this program and ascertain whether or not these products are still in place. We are aware that there have been times when a problem occurred with the use of these products, so if the equipment had to be removed, we would like to note that also. And for your information, there is no penalty for removal of this equipment.

The whole verification, along with several questions and answers, should take no longer than half an hour to a few hours depending on how large your complex is and how many high efficiency products were installed. We would like to be able to schedule an on-site survey to accomplish this.

If you will give me the best time of day for the appointment and which week will be best for you, a surveyor from ASW will be calling you to schedule an appointment within the next 2 weeks.

Do you have any questions that I may be able to answer at this time?

Thank you very much for your cooperation.