NEWCOMB
ANDERSON
ASSOCIATES

REPORT

Power Savers:
Lighting Retrofits for San Francisco Small Businesses

Final Report

Prepared for the
City and County of San Francisco
Department of the Environment
San Francisco, California

Prepared by

Newcomb Anderson Associates
505 Sansome St., Suite 1600
San Francisco, CA 94111
Phone: (415) 434-2600

1209.14

August 2003

Table of Contents

PREFACE

Newcomb Anderson Associates, of San Francisco, California, prepared this report as a consultant to the City and County of San Francisco Department of the Environment (SFE). The authors of this report are Mary Matteson Bryan, P.E., Marc A. Theobald, and Curtis P. Schmitt, P.E., of Newcomb Anderson Associates and Sue Malone of Gateway to Capital. The Newcomb Anderson Associates Program Manager for the Power Savers Program is Mary Matteson Bryan, P.E. This report was edited by April K. Banerjee, C.E.M.

1. EXECUTIVE SUMMARY

The Power Savers Program provided lighting efficiency improvement services to under-served small businesses in San Francisco. In order to move energy efficiency lighting solutions into the hard-to-reach small business market, the Program was designed to provide a complete package of services through a single, objective point of contact for the customer. Program participants benefited from a turn-key process supervised by a trusted source and from maximized energy savings per site through comprehensive lighting retrofits.

The Program was extremely successful, achieving its installation and demand savings goals, on time and within budget. Table 1.1 summarizes the program achievements.

Table 1.1: Program Results

Program Results	Goal	Achieved
Time Period	21 months	**13 months**
Surveys Completed	6,600	**5,698**
Installed Sites	3,960	**4,069**
Demand Savings (kW)	5,940	**6,008**
Close Rate	60%	**70%**

Some of the most important factors that contributed to the success of the Program are summarized below.

- Direct Marketing to Small Business Owners
- Flexibility with Program Eligibility
- Incentive Levels that Paid the Majority of the Customer Cost
- Turn-key Installations
- Quick Payment of Incentives
- Partnership with Community Organization
- Comprehensive Database Management Tool (FACET™)
- Comprehensive Survey and Installation Standards and Practices

2. PROGRAM DESIGN

2.1 Background

The Program design included five main elements: marketing and outreach, financing, lighting surveys and sales, a monetary incentive, and installation and construction oversight. Each of these elements is discussed in more detail in later sections of this report. A discussion of the general program elements that contributed to the successful achievement of the program goals is provided here.

2.2 Critical Success Factors

Flexibility with Program Eligibility

The original eligibility guidelines for Power Savers were defined in the program funding contract.

- All commercial customers with A1 electric accounts serving a single facility.
- All commercial customers with A6 electric accounts serving a single facility.
- All commercial customers with an A10 electric account, with a peak demand of 20 kW or less, as estimated after lighting retrofits are installed.
- All commercial customers with an E19 electric account, with a peak demand of 20 kW or less, as estimated after lighting retrofits are installed.

Newcomb Anderson Associates requested eligibility flexibility in three areas.

1) Commercial customers billed through a master electric meter, provided that the customer's portion of the billed demand was estimated to be less than 20 kW after lighting retrofits are installed.
2) A limited number of commercial customers with peak electricity demand readings between 20 and 100 kW.
3) A limited number of hotels, motels, and other establishments that were clearly small businesses yet are billed on rates other than A1, A6, A10 and E19.

These additions and clarifications provided Power Savers with additional flexibility to serve the target market and meet its stated goal of a 6 MW reduction in lighting demand.

Incentive Levels that Paid the Majority of the Customer Cost

Power Savers' incentive levels were calculated as a fixed incentive for each customer plus an incentive based on demand savings, with a minimum customer contribution of $50. The incentive was capped at the project cost, less the minimum customer contribution. The following formula was used.

Incentive = $290 + $195/kW

For the small businesses targeted by Power Savers, first cost was often the only factor that influenced the decision to proceed with installation. While many customers understood that the lighting retrofits would generate cost savings from reduced lighting energy use and that the installation cost would be recovered in a short time by these savings, projects with

payback periods as short as 6 months were sometimes rejected. The reasons ranged from lack of cash to pay the customer share of the installation cost to uncertainty in the long-term viability of the business.

With an average incentive level of approximately $540, the incentive paid the entire cost of the smallest jobs, less the minimum customer contribution. Reducing the first cost to the customer was a key factor in successfully closing the sale.

Turn-key Installations

Typical energy efficiency rebate programs offer customers monetary incentives to reduce the cost of installing energy efficiency measures and may provide technical assistance to identify energy efficiency opportunities and quantify potential savings. However, they do not provide installation services. In most cases, these programs do not even provide access to installation contractors. At most, the programs may provide a generic list of installation contractors. The work of securing a contractor, negotiating pricing for the work, and managing project installation are left with the customer. For small, hard-to-reach businesses, implementation of these final steps is a major barrier to achieve final project installation. Even when business owners are interested in having the work completed, they often do not have the time or knowledge to secure and implement installation services.

In contrast, Power Savers offered customers complete turn-key installations. Power Savers provided no-cost lighting surveys, standardized pricing, project installation, construction management and quality assurance. Because the Program and not the customer had the responsibility of moving from project identification to installation, the Program could ensure that projects were installed and completed on a timely basis. Power Savers offered standardized, pre-negotiated pricing, eliminating the need to obtain multiple bids from various contractors. All contractual obligations for the contractor to complete the work and for the customer to pay the customer share of the installation cost were between the business owner and the contractor. This turn-key service was a critical factor in the successful installation of lighting retrofits.

Quick Payment of Incentives

At the inception of the Power Savers Program, Newcomb Anderson Associates identified the need to pay the program incentives promptly to installation contractors. Meeting the very aggressive goals of the program, 6 MW of savings in 13 months, would require a significant investment by the installation contractors in labor and materials. Prompt payment to the contractors would ensure their ability to achieve this necessary high production rate. For contractors with competing demands for their services, prompt payment would also make Power Savers more desirable than other incentive programs that typically take much longer to process incentive checks.

In order to achieve prompt payment, Newcomb Anderson Associates negotiated with the San Francisco Department of the Environment to establish an Advance Incentive Account from which incentive payments could be made almost immediately after the end of the month invoicing. With this account, incentive funds for approved work typically were paid to installation contractors within 5 business days of the end of the month. Upon receipt of payment from SFE, Newcomb Anderson Associates deposited to the Advance Incentive Account an amount equivalent to the incentive payments made from the Account.

The consistent quick payment of incentive funds to installation contractors was the most important factor in maintaining the commitment and interest of the installation contractors. It was arguably the program element that most significantly contributed to the achievement of the high production rate necessary to meet the program goals in the short time period available.

Partnership with Community Organization

Power Savers formed a partnership with a local community organization, the San Francisco Community Power Cooperative (Co-op), to provide additional incentive dollars for lighting retrofits. The Co-op is a community-based/community-owned organization whose mission is to improve environmental and economic conditions in the historically disadvantaged Bay View/Hunter's Point neighborhoods by focusing on energy efficiency improvements for residents and businesses. For small businesses in these neighborhoods, the Co-op provided up to an additional $500 toward the cost of lighting retrofits for businesses that were solicited by Power Savers and that agreed to join the Co-op.

This partnership enhanced Power Savers' success in the Bay View/Hunter's Point area of San Francisco. The additional incentive enabled many business owners to participate who otherwise would not have had the funds to pay the customer share of the lighting retrofit. Close to 700 businesses in these neighborhoods received new efficient lighting through Power Savers, approximately 18% of the total number of installations. The majority of these customers joined the Co-op and received additional incentive dollars.

2.3 Results

Program results are shown on the tables and graphs following this page.

Table 2.1: Program Statistics

DATE: August 6, 2003	TOTAL	AVERAGE
Installed Projects	4,069	
Total Project Cost	$3,979,029	$977.89
Incentive Paid	$2,193,220	$539.01
Customer Cost	$1,785,808	$438.88
Demand Savings (kW)	6,008	1.5
Energy Savings (kWh/yr)	20,274,569	4,983
Monetary Savings ($/yr)	$3,563,048	$875.66
Customer Simple Payback (yrs)	0.5	0.5

Table 2.2: Monthly Program Tracking

Date	Total Presented	Total Accepted	Total Installed
May-02	215	87	32
Jun-02	128	47	30
Jul-02	592	428	164
Aug-02	901	580	455
Sep-02	631	407	290
Oct-02	651	460	400
Nov-02	615	440	419
Dec-02	442	334	459
Jan-03	490	377	504
Feb-03	338	310	270
Mar-03	326	213	382
Apr-03	183	148	94
May-03	125	210	83
Jun-03	61	28	322
Jul-03	-	-	165
Total	**5,698**	**4,069**	**4,069**

Table 2.3: Cumulative Program Tracking

Date	Total Presented	Total Accepted	Total Installed
May-02	215	87	32
Jun-02	343	134	62
Jul-02	935	562	226
Aug-02	1,836	1,142	681
Sep-02	2,467	1,549	971
Oct-02	3,118	2,009	1,371
Nov-02	3,733	2,449	1,790
Dec-02	4,175	2,783	2,249
Jan-03	4,665	3,160	2,753
Feb-03	5,003	3,470	3,023
Mar-03	5,329	3,683	3,405
Apr-03	5,512	3,831	3,499
May-03	5,637	4,041	3,582
Jun-03	5,698	4,069	3,904
Jul-03	5,698	4,069	4,069

Figure 2.1: Power Savers
Cumulative Monthly Totals

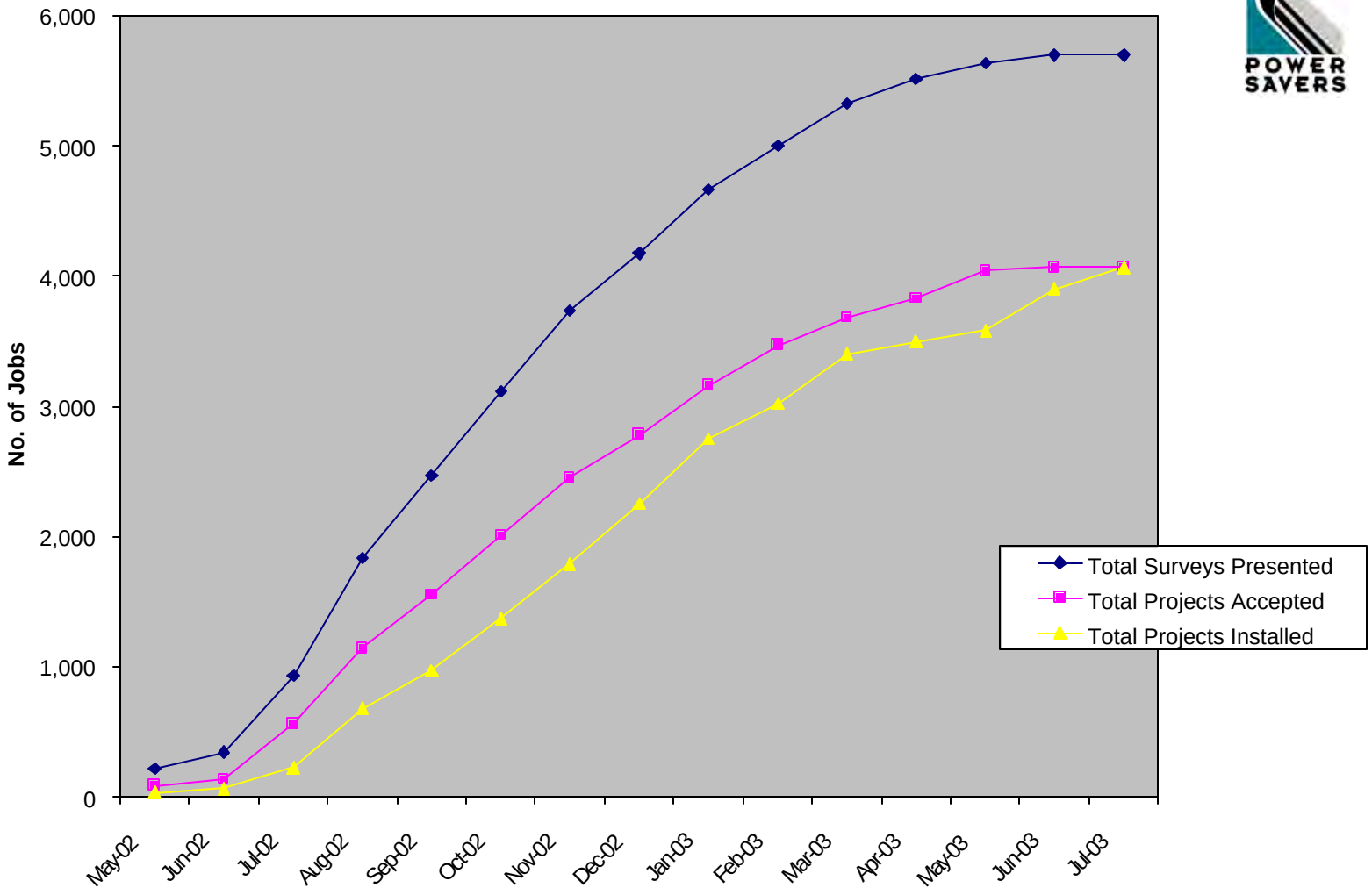


Figure 2.2: Power Savers
Jobs Sold by Zip Code

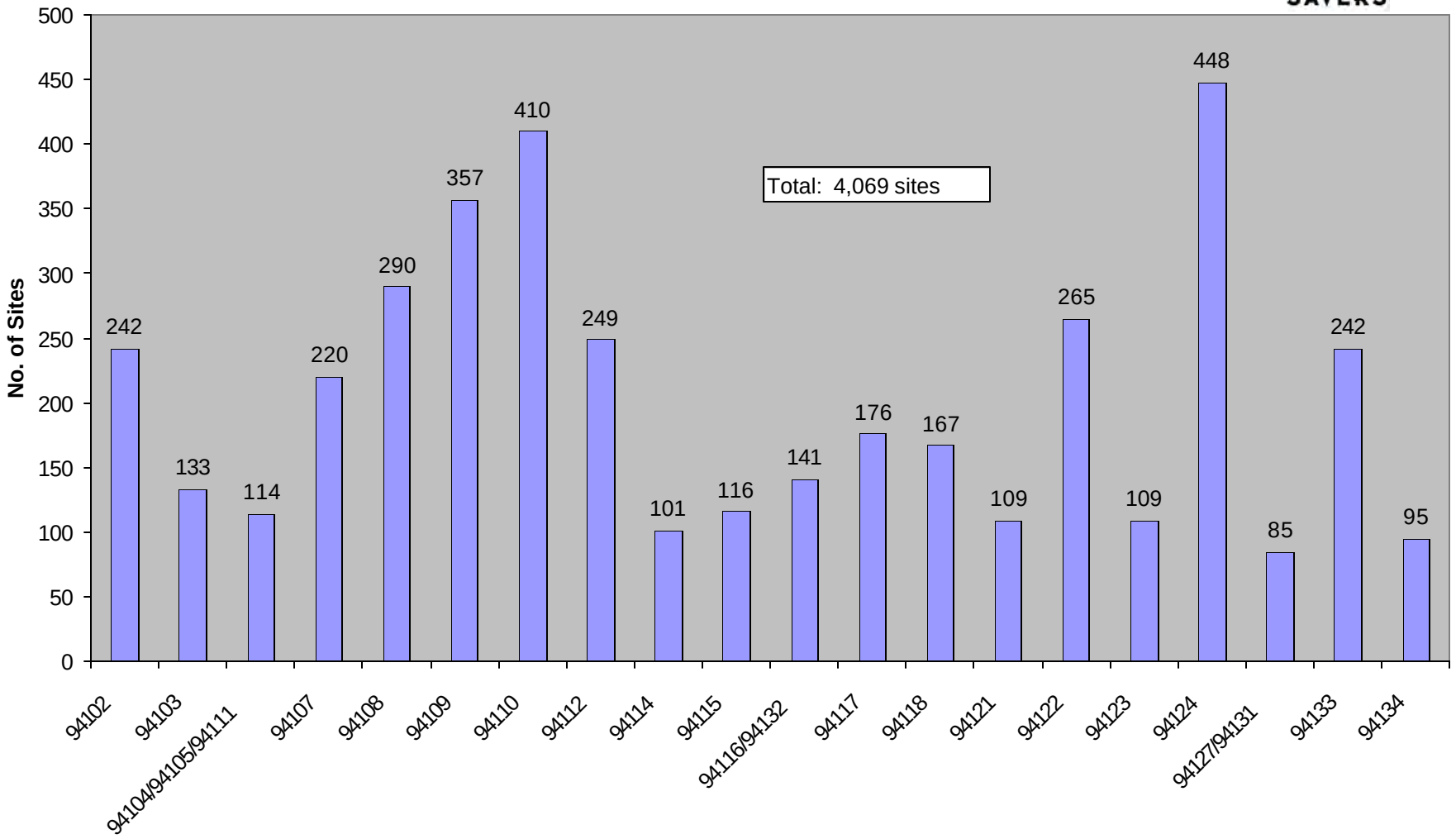


Figure 2.3: Power Savers
Electric Demand Saved by Zip Code

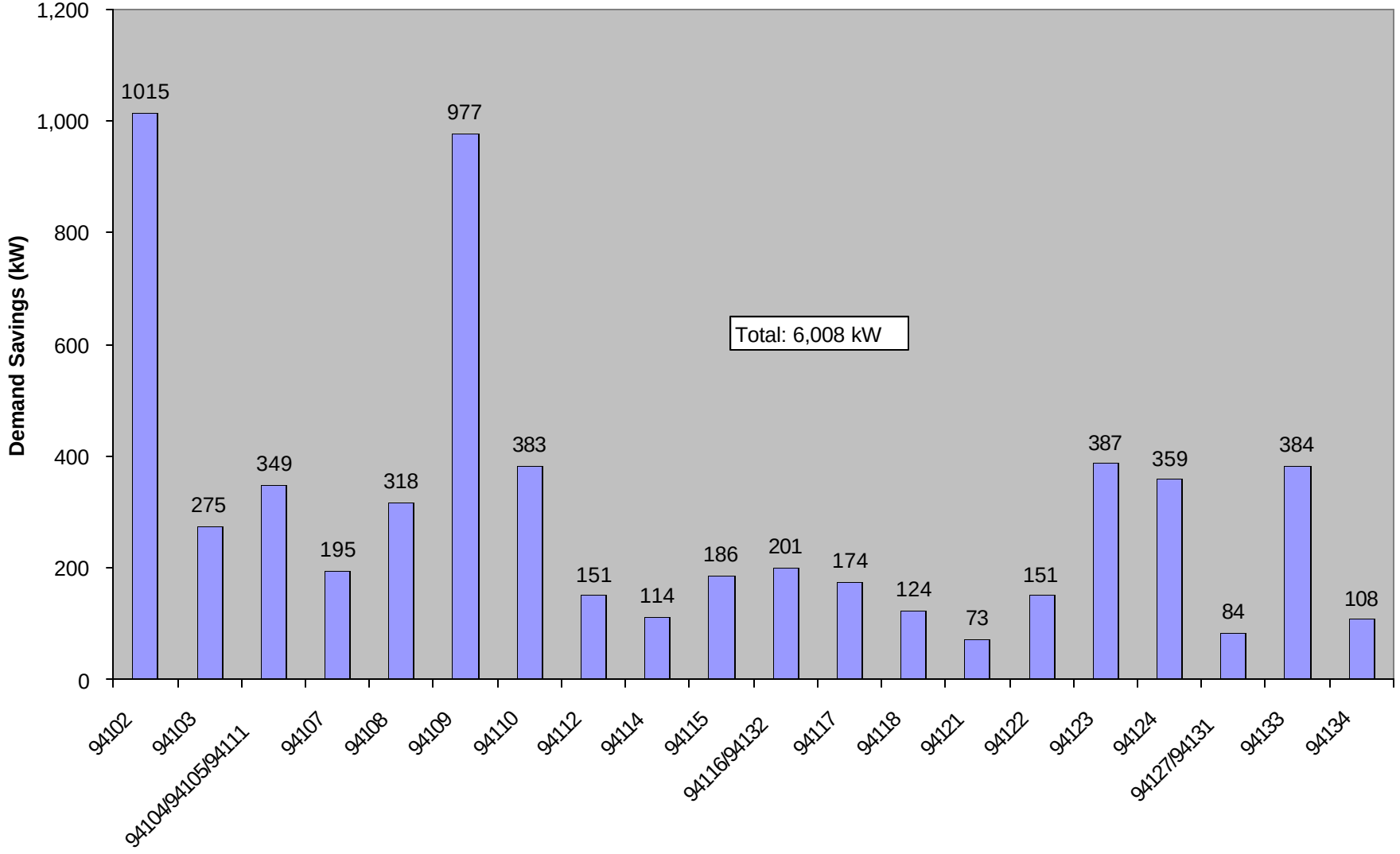
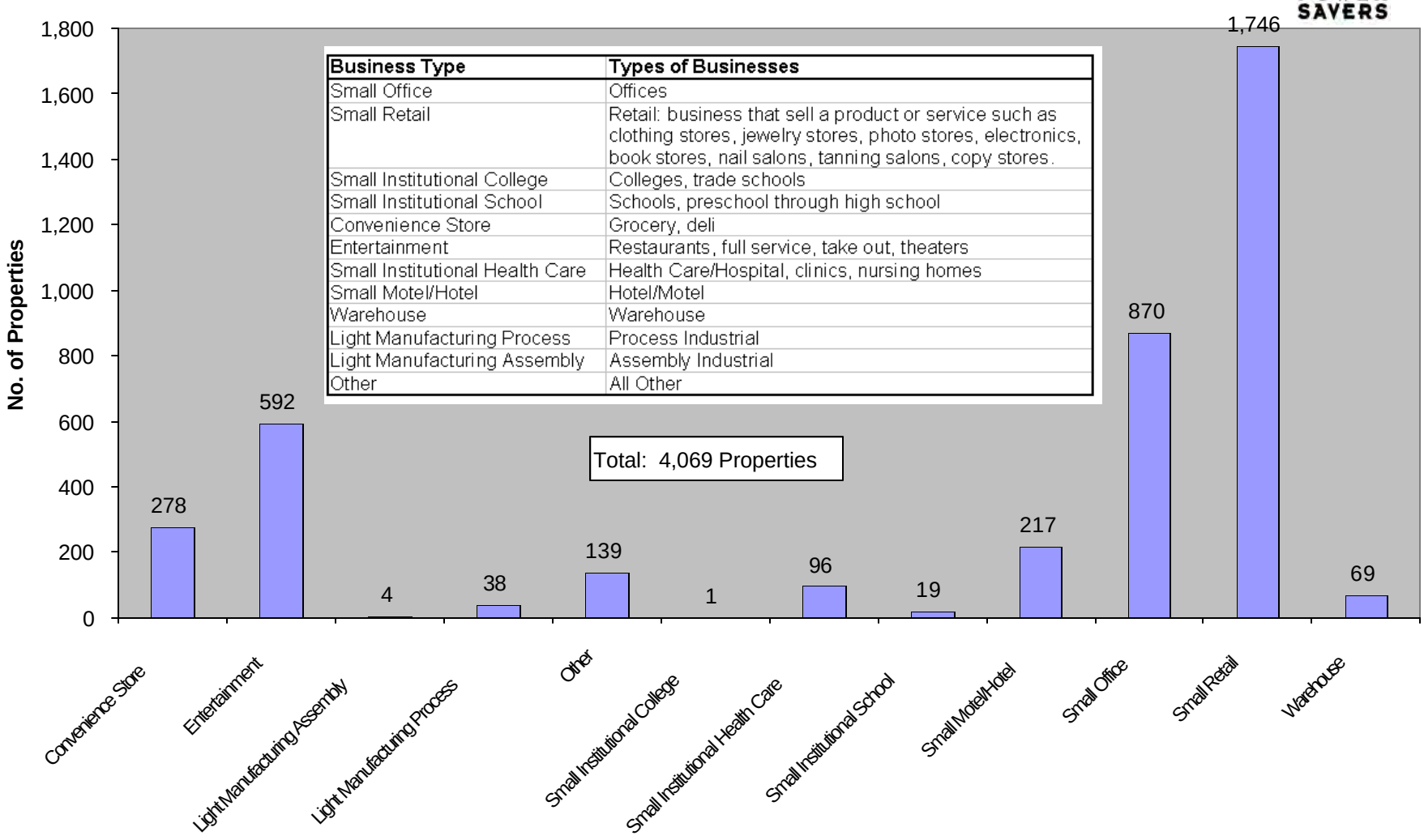
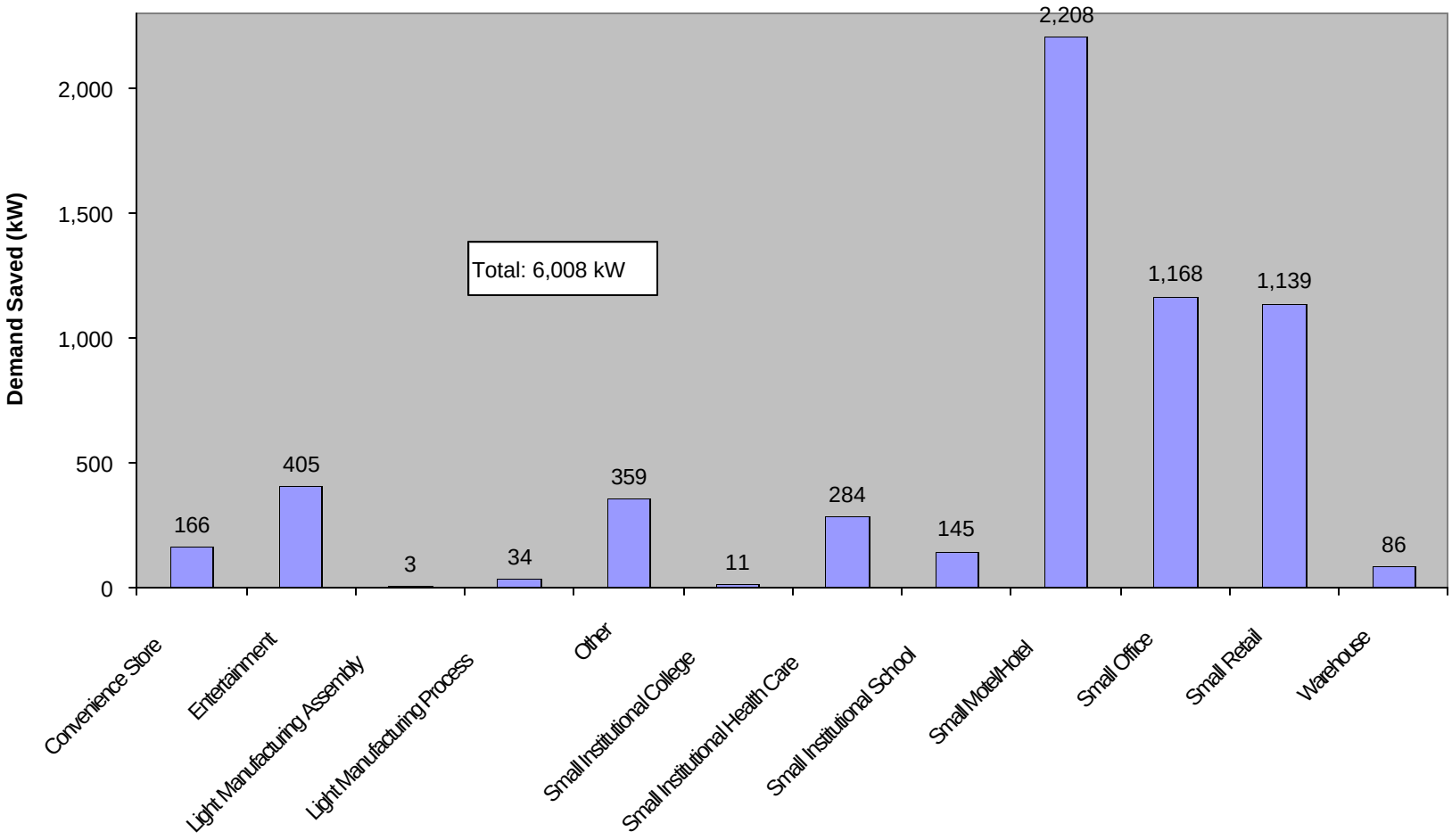


Figure 2.4: Power Savers
Total # of Sold Jobs by Business Type



Business Type	Types of Businesses
Small Office	Offices
Small Retail	Retail: business that sell a product or service such as clothing stores, jewelry stores, photo stores, electronics, book stores, nail salons, tanning salons, copy stores.
Small Institutional College	Colleges, trade schools
Small Institutional School	Schools, preschool through high school
Convenience Store	Grocery, deli
Entertainment	Restaurants, full service, take out, theaters
Small Institutional Health Care	Health Care/Hospital, clinics, nursing homes
Small Motel/Hotel	Hotel/Motel
Warehouse	Warehouse
Light Manufacturing Process	Process Industrial
Light Manufacturing Assembly	Assembly Industrial
Other	All Other

Figure 2.5: Power Savers
kW Savings by Business Type



3. INTERN OUTREACH

3.1 Background

The Outreach Program was established to provide large volume canvassing to generate interest in Power Savers and solicit customer participation. The Outreach Program began the first week of June 2002 with the Outreach Manager hiring a field manager. Shortly thereafter, 13 interns and one data entry person were hired. The Outreach Manager oversaw the outreach staff.

The Outreach Manager had oversight responsibility for the Outreach Program. These responsibilities included hiring of the outreach staff and reporting to the Power Savers Program Manager and the San Francisco Department of Environment Program Manager. The Outreach Manager ensured that all outreach staff were in compliance with the employment regulations of the federal, state and City rules. The Outreach Manager developed the overall structure of the Outreach Program, including layout of the geographic areas for canvassing assignments. Other responsibilities included oversight of the weekly meetings, where results of the previous week were discussed and the following week's agenda was established. The Outreach Manager was also responsible for identifying resources for lists of small businesses that could be used for marketing, such as office building databases and restaurant databases. In addition, the Outreach Manager canvassed the City to identify areas where the interns had not yet reached.

The field manager was responsible for the day-to-day operations of the Outreach Program. These responsibilities included signing the interns in and out, assignments of neighborhoods for canvassing, pairing of the interns, logging checkpoint phone calls, and providing marketing materials. The field manager also recorded the daily hours worked by the interns and prepared a summary of each day's total signed authorizations collected and businesses visited.

The database of small businesses contacted by interns was the most important result of the Outreach Program. The database contained all of the locations visited whether or not an authorization was collected. Tracking was set up by neighborhood, by authorization, and by intern. Data were entered with the date first contacted and last contacted. A total of 8,310 businesses were contacted and accounted for in the database.

PHASE I - Summer Outreach Program

Thirteen college students and other personnel were hired to market the program throughout the City and County of San Francisco. The interns went through an initial week-long training program, with an ongoing weekly half-day training throughout the course of the project. Their main function was to reach the small businesses by direct contact with the business owner. The interns explained the Power Savers Program to the business owner and solicited the owner's participation, indicated by a signature on a Survey Authorization Form and the utility account number.

Each morning the interns were paired and assigned a certain section of the City to canvas. They were provided with bus passes and calling cards. They called into the field manager prior to the lunch break to provide a status report. Also, they were instructed to call if they had finished one neighborhood and were moving to another. At the end of the day, the interns came back to the office with the signed authorization sheets and a summary of the

day in the field. The pairing of interns changed every few days. The interns were paid an incentive for each signed authorization sheet. The Summer Outreach Program interns gathered a total of 2,926 signed authorizations during the program.

With the large number of non-English speaking businesses in San Francisco, it was important that the Outreach Program include multilingual staff. Interns were hired who were fluent in Russian, Mandarin, Cantonese, and Spanish.

Upon the completion of the first phase (10 weeks) of the Outreach Program, the outreach staff had canvassed all business districts in the City twice.

PHASE II – Fall Outreach Program

After the large scale canvassing was completed during the summer, a similar, but smaller effort was conducted in September, October, and November with a staff of four interns. Three of the four interns were given the master data base list, which held the information by address as to who had signed the Survey Authorization and who had not. Their objective was to contact by telephone the businesses that had not signed a Survey Authorization in an attempt to generate interest in participating in Power Savers. If the customer expressed interest, a Survey Authorization was faxed to the business owner for the owner to sign and fax back. Two days a week the interns went directly to the businesses where phone solicitation had been unsuccessful. The goal for each intern was to collect 50 authorizations per month. An intern who spoke Mandarin assisted a lighting auditor in the field in the Asian community. Another intern focused strictly on office building owners.

The field manager continued to be responsible for collecting the daily data from the interns and keeping track of the Survey Authorizations that were collected. The field manager took on the additional responsibility of outreach to restaurants in the community. He contacted the owners or managers of the establishments either by telephone, fax, or in person to solicit interest in Power Savers.

Upon completion of this phase, the Outreach Program staff had contacted over 8,000 small businesses within the City of San Francisco. The telemarketing outreach team contacted over 450 businesses each week, averaging 20% signed Survey Authorizations.

3.2 Critical Success Factors

Direct Contact with Business Owners

Reaching small business owners is a very challenging task. Most small business owners are extremely busy with the daily tasks of running their businesses. In addition, most are not knowledgeable about energy issues and opportunities to reduce their energy consumption and thereby their energy cost.

Traditional marketing strategies attempted by Power Savers[1] were very limited in their success. In order to get the attention of the small business owners and provide the information to generate interest in Power Savers, direct contact with the owners proved to

[1] Ads, editorial articles, public service announcements, inserts in neighborhood newspapers, four-color posters in bus shelters, open houses, association presentations.

be essential. Business owners responded positively to a face-to-face solicitation, where their questions and concerns could be addressed.

Eager, Dedicated, Multilingual Intern Staff

The enthusiasm and dedication of the outreach interns was critical to the success of the marketing effort. The interns maintained their commitment to Power Savers for the duration of the Outreach Program, and were very reliable and responsible. They developed a positive camaraderie and were very supportive of one another. Additionally, having outreach staff with multiple language skills was critical to reaching the ethnically diverse San Francisco business community.

3.3 Suggestions for Improvements to Future Efforts

Data gathered from the Outreach Program was consolidated in an Excel spreadsheet. As the number of businesses that were contacted grew, this spreadsheet became very difficult to maintain. It is recommended that future efforts consolidate data using a suitable database software, such as MS Access. A networked version of a multi-user contact management software tool would have been helpful as well.

3.4 Results

Total Small Business Customers Identified: 8,310
Total Survey Authorizations Obtained: 2,946

4. FINANCING

4.1 Background

Power Savers provided a significant monetary incentive to reduce the installation cost of the lighting retrofit, however, the customer had to pay a portion of the cost. In some cases, small business owners could not afford to pay this cost with available cash. The Power Savers financing program provided opportunities for the customer to finance the retrofit cost with better than average terms using a simple loan application and approval process.

4.2 Critical Success Factors

Confidentiality

Keeping the financial details of the small business confidential was the most critical factor in the success of the securing of financing for interested Power Savers participants. The majority of the small businesses that applied for financing for Power Savers installations were very concerned that the financial information submitted on the loan applications would become public knowledge. The one-on-one assistance offered to the small business owner allowed a trust to be built between the Program and the owner, which in turn gave the owner confidence to move forward with the loan. Power Savers guaranteed that financial details would be kept confidential.

Multiple Lenders

Power Savers offered financing from eight different lenders. The availability of multiple lending institutions was also a critical factor in the success of the financing offering from Power Savers. Many small business owners are unable to secure small lending finance; the availability of many lenders provided the owners with a higher chance of securing financing. With a variety of banks available, alternative methods of financing could be considered. In addition, some of the lenders were able to offer flexible terms and more lenient credit scoring so more businesses could be financed.

Installation Contractor Offering

One of the installation contractors offered their own in-house financing to several hundred small businesses. This financing typically took the form of equal payments over time (3 to 6 months). For small loan amounts, in most cases the payments were calculated with no interest. For larger loan amounts or for extended payment terms, sometimes interest at an annual rate of 3%-5% was charged. For many small businesses, this payment flexibility made it possible to participate in the program.

4.3 Suggestions for Improvements to Future Efforts

Provide Streamlined, Single Financing Option

Of the over 4,000 customers served by Power Savers, only 55 chose to finance the customer cost of the installation. However, one of the installation contractors also offered "three easy payment terms" to several hundred small businesses. Overall, the financing component of the Program was very limited and having a financing option was not critical to

the overall success of the program. Having a financing offering was useful to Power Savers in terms of customer service, however. Those customers that chose to take advantage of the financing program were typically businesses in very difficult financial situations and the loans were critical to their ability to participate in the Program.

In addition, the structure of the Power Saver financing offering provided very customized service to the individual business owners. This was often necessary because of the complex financial issues facing many of these hard-to-reach businesses, in terms of poor credit ratings and other issues. As a result, the Program cost of providing a financing option was relatively high.

A financing offering adds significant administrative costs and is not essential to the success of a program similar to Power Savers. For these reasons, a financing offering is not recommended for future efforts. However, if a financing offering is desired for customer service reasons, it is recommended to reduce the administrative costs by streamlining the offering. A single offering should be developed with a simplified application form that is completed by the customer and submitted directly to the lending institution.

4.4 Results

Figure 4.1: Financing

Financing Contacts	121
Number of Loans Funded	55
Dollars Funded	$263,000
Funded Loans by Lending Institution	
Wells Fargo	13
California Bank and Trust	0
Innovative	23
Bank of America	2
Cal-Fed	6
Sequoia Bank	3
US Bank	6
Union Bank	2

5. SURVEYS

5.1 Background

The Power Savers Program offered customers a no-cost lighting survey, with an opportunity for customers to have lighting upgrades performed at a cost well below market value. The role of the lighting surveyor was to provide each customer with a sound set of recommended lighting upgrades (technical function), and to obtain the customer's authorization to perform the work (sales function).

The program used four channels to perform these technical sales:

1. Independent Sales Agents having both a lighting and sales background,
2. San Francisco Department of the Environment's staff technical resources for piloting "new" strategies,
3. Newcomb Anderson Associates' program staff as required; typically for large sites or complicated field conditions,
4. Direct survey and sales by Installation Contractors.

5.2 Critical Success Factors

Comprehensive Database Management Tool (FACET™)

The selection and use of a comprehensive database management tool (FACET™) specific to recording lighting system data, calculating retrofit savings, and generating reports for a variety of sales, engineering, and administrative functions was critical to the overall management of the Program. Independent Sales Agents and Power Savers staff members used FACET™ to record lighting system and property information for small business customers. Surveyors replicated this information to a central database over phone lines or network connection on a regular basis. This model of remote data exchange enabled surveyors to work independently while sharing and maintaining a constantly growing body of information.

Survey Standards and Practices

Newcomb Anderson Associates developed a set of survey standards and practices that were amended as required throughout the Program duration.

Input wattage assumptions were derived from tables used for the CPUC's California Standard Performance Contract (SPC) Program. The survey standards included recommended practices for increasing, maintaining, or reducing light levels depending on customer requirements. For each application, standard practices were designed to provide the greatest amount of load reduction (kW saved) per customer dollar spent. These practices were embedded in the FACET™ software as pre-set standard project options. Surveyors were encouraged to apply the "standard" projects, however, the Program permitted surveyors the use of more advanced FACET™ features to develop application-specific approaches to lighting systems on an as-needed basis.

While recommended practices were generally constant, the Program incorporated interim product development as it was brought to market. In cases where solutions were not optimal, practices were discontinued and alternate solutions were developed and applied.

Newcomb Anderson Associates required surveyors to conduct a quality control review of the survey results prior to submitting a cost and savings proposal to the customer. Additionally, the Survey Manager and other staff provided technical field support and quality assurance review of selected customer proposals.

Contractor Sales Program

The program design incorporated the development and implementation of a "Contractor Sales" program. Contractors were provided incentives of varying types depending on their participation: contractors who provided "leads" were awarded the contracts for installation, if the owner chose to participate in the Program. Contractors who provided leads and were able to secure agreements to install from the owner were provided with commissions in addition to being awarded the installation contracts. In order to "make the sale", contractors needed to be able to calculate the costs, incentives, and savings associated with the lighting proposal. Newcomb Anderson Associates chose not to provide the FACET™ tool to contractors for reasons of maintaining customer confidentiality, therefore, contractors were forced to develop a parallel means of calculating the project economics. One contractor invested in a comprehensive means of doing this and provided by far the greatest sales volume to the Program.

5.3 Suggestions for Improvements to Future Efforts

Alignment of Independent Surveyors and Contractors

Independent surveyors and program personnel conducted surveys that resulted in about 18% of the installations. This process tended to result in more complete and tailored jobs, however, it also resulted in some disconnect between the survey and the installed work. It is recommended to consider assigning independent surveyors to generate work for specific contractors in order to improve coordination between sales and installation. Another option might be to eliminate the independent sales function altogether, and rely exclusively on contractor-based sales methods.

5.4 Results

Power Savers performed surveys and presented results to about 5,700 small business customers. About 72% of these surveys resulted in installed jobs. (See the Appendix for graphs that illustrate the percentage breakdown between the categories of surveyors for three of the program metrics. These metrics are the distribution of "surveys presented", "installations complete", and "kW saved".)

Installation contractors conducted about 64% of the surveys, and were responsible for selling approximately 82% of installed jobs. Installation contractors also had the highest ratio of demand saved per job sold (1.5 kW/site). This is a result of stringent demand reduction guidelines for contractor sales that were not incorporated in the guidelines initially developed for independent sales agents. The guidelines for independent sales agents were later changed, and independent sales agents were held to a minimum load reduction per site.

6. INSTALLATION AND CONSTRUCTION MANAGEMENT

6.1 Background

Power Savers pre-qualified lighting contractors for participation in the Program and used these contractors to provide and manage construction services efficiently, minimizing administrative time. Standard program pricing for materials and labor was negotiated with the contractors. Detailed Installation Standards and Participation Guidelines were developed to define the installation process and specify the expected level of quality of work performed under the Program. A Quality Assurance Program was developed to ensure consistent application of those standards. During installation of lighting retrofits, contractors were managed as part of the quality assurance process.

6.2 Critical Success Factors

Contractor Request for Proposals

Newcomb Anderson Associates staff developed a Request for Proposals (RFP) to obtain information about contractors interested in participating. Responses enabled Newcomb Anderson Associates to pre-qualify contractors for the Program. The key to success in the RFP process was factoring in contractor attrition, both in the RFP process and during the Program. Requests for Proposals were released at a "pre-bid" meeting, where requirements of the proposal and the details of the Program were discussed. Thirty-three contractors were invited to the "pre-bid" meeting, and only eighteen attended. Nine submitted proposals, with eight of those eventually accepting all terms of and signing the Participation Agreement. All eight of these, as well as a few that agreed to the Participation Agreement after terms and prices had been set, were essential for the program to meet its goals given its aggressive schedule.

Unit Prices for Standard Retrofits

The hinge-pin to the Participation Agreement, and the critical link between surveys and construction, was the fixed pricing of standard retrofits. Once contractors agreed to the fixed prices, it was guaranteed that surveyors could sell jobs with any of the standard retrofits, and a contractor would construct the jobs without having to negotiate a price. This was critical both for the sales process and as a means of keeping customer costs down to facilitate the required volume of jobs.

The key to negotiating low unit prices was a multi-faceted approach. The first step was to ask the contractors to submit their proposals in a competitive bid process. The bids were then analyzed, and unit prices based on average bids were used as a starting point. A preferred distributor was selected through a separate RFP process. Material prices from the preferred distributor were then compared with the material prices supplied in the competitive bid process, and it was determined that while allowing for a moderate 25% mark-up plus tax, the material prices could be reduced by 21% by using the preferred distributor. Key retrofits that were determined to be critical to the success of the Program (F40 two-lamp and F40 four-lamp retrofits, 14 W compact fluorescent lamps, etc.) were adjusted by an additional discount. This methodology resulted in low unit prices that proved to be reasonable. Despite several initial reservations and concerns from some of the contractors, eight of the nine contractors who submitted bids eventually accepted these prices.

Preferred Distributor

Despite requiring a substantial amount of resources to be committed early in the process, having a preferred distributor proved extremely valuable. The resources required to develop an RFP and manage the RFP process, train the distributor on Program requirements, and resolve initial conflicts between contractors and the distributor proved worthwhile for the benefits gained throughout the Program.

Due to the potential for a large volume of sales, the preferred distributor agreed to provide material at a fair discount from market price to all Power Savers contractors for the duration of the Program, and to add any new items requested at cost plus a fixed margin. This agreement eliminated the necessity of renegotiating measure prices during the Program based on rising costs of materials. Obtaining the standard material prices was one of the keys to negotiating low measure prices (see above) with contractors. The ability to obtain reasonable prices for new material items being added to the Program without having to seek bids reduced the resource requirements later and reduced delays when new items were needed.

Contractor Selection

The right contractors, selected at different stages of the Program, were instrumental to Power Savers' success. Initially, the key to contractor selection was to select more contractors than would be ultimately required. To accomplish this, all responding contractors who passed the basic background check (credit, references, proposal quality), and would accept the terms of the Participation Agreement (including unit pricing), were accepted into the Program. This allowed flexibility in the assignment of work to contractors, with the ability to not assign work to contractors who performed poorly.

The second key to selecting contractors was to be open to additional contractors who expressed an interest in joining the Program after it was already in progress. Even after the RFP process and initial selection, any contractor who passed the basic background check and agreed to the conditions of the Participation Agreement were accepted into the Program. Though many contractors who applied in this way were not effective in the Program due to lack of ability on their part, one very significant contractor was brought into the Program this way, making it worthwhile.

Contractor Training

Spending time initially with contractors to review Program procedures and requirements facilitated smooth completion of jobs and relatively few problems with paperwork. Prior to assignment of the first job to a contractor, Newcomb Anderson Associates' Construction Management team met with each contractor for training and review of the process. This training included work scopes, completion of paper work, change orders, incentive payments and Program specifications. Exceptions were made for contractors that customers specifically requested and were only going to install one or two jobs.

Job Walks with Contractors

Job walks were required of contractors as a means of verifying the given work scope, identifying field conditions, and signing a contract with the customer before accepting the job for construction. A Newcomb Anderson Associates construction manager conducted job

walks with each contractor for the first few jobs assigned. This job walk allowed the construction manager and contractor to review the scope, discuss common nomenclatures from FACET™, and review procedures while on site.

Initially, Newcomb Anderson Associates construction managers met with each new contractor for five jobs, to give enough of a variety of projects and potential customer issues to identify any problems before contractors conducted job walks on their own. This process, however, was only required for jobs sold by independent surveyors as a means of linking the survey and construction processes. Contractors involved in the Contractor Sales process were not required to conduct a second job walk, as they had specified the job and already had a contract with the customer.

Mid-construction Visits

Newcomb Anderson Associates inspection of jobs under construction was valuable as both a construction management method and savings verification tool, especially early in the process. Observing first-hand the contractors' methods, materials and workmanship early enough to identify trends or problems saved time and difficulties later in the quality control process. Such visits verified that information from the initial coordination and training that took place with contractors reached the foremen, who were ultimately installing the work and establishing a relationship with the customers. This proved valuable for troubleshooting problems later in the program.

Field Change Orders

Initially, Newcomb Anderson Associates required contractors to submit all change order requests to the Program for approval prior to implementation. After approval, a construction manager would issue the change order documentation to the contractor for construction. It quickly became evident that this method was too time-consuming and cumbersome for the volume, low margins, and goals of Power Savers. Under this method, contractors had to either make multiple trips to customers that had even the simplest change orders or, worse yet, ignore any changes. Had this continued, contractors would have quickly withdrawn from the Program, as they would not have remained profitable.

The key to success here was to give the contractors the ability and authority to calculate and execute change orders in the field. Two different methods were adopted to suit different contractors, depending on the preference of both the Program staff and contractor. Initially, Newcomb Anderson Associates created a form and calculation tool that allowed contractors to calculate the proper savings-based incentive using a chart of common lighting systems and retrofits. Most contractors used this tool to maximize what they charged for the change orders and guarantee they would remain within Program guidelines.

Under the second method, which evolved with the comfort and approval of the Newcomb Anderson Associates construction manager, one contractor chose to "estimate" the change orders at costs that benefited the customer. Additional compact fluorescent lamps were given at no extra charge, additional retrofits were generally done at less than the cheapest Program-approved customer cost, and deductions from the scope of work were compensated for often using prices that resulted in a greater reduction in price than the originally quoted cost. This method allowed foremen in the field to use judgement and use round numbers to add or subtract fixtures, contributing to the ability of the contractor to maintain a high production rate.

Adaptation of Paperwork

Overall flexibility was a key to the Program's success, and this extended to the paperwork used by the construction crews. Newcomb Anderson Associates' willingness to change the FACET™ reports to aid installers was key to smooth installations and minimizing quality control issues. The best example of this and its impact is the addition of a place for customers to initial on the completion certificate that they received spare lamps. This really served as a reminder to the foremen to provide spare lamps and prevented quality control problems. Prior to this change, approximately 75% of the sites inspected for quality control had not received the spare lamps required by Newcomb Anderson Associates. This simple fix nearly eliminated this problem and saved both contractors and construction managers countless hours and costs.

Quality Control

Quality control inspections (QCs) were essential to ensure accurate documentation and realization of savings. Newcomb Anderson Associates' policy was to inspect the first 10 installations completed by a contractor, and a minimum of 10% of installed jobs thereafter, selected at random, for quality control. The initial 10 QCs played a critical role in identifying major problems early, and identifying poorly performing contractors (see below). The random 10% QCs after the "probation" period was designed to maintain the contractors' performance and ensure specifications and scopes of work were being followed.

Final QC statistics are listed in Section 6.4. During most of the Program, construction managers aimed for a QC rate between 10% and 20%. This rate of review allowed for easy identification of potential problems, which were few. It also allowed a wider variety of job types and locations to be reviewed. In only a few occasions were additional QCs called for as a result of repetitive problems identified for specific contractors. These usually related to use of different material than specified (e.g., normal versus low power ballasts). Increased QC inspections in these cases helped to correct problems quickly and increased the reliability of the documented savings.

Quick Identification of Non-performing Contractors

Newcomb Anderson Associates inititally assigned a batch of five jobs to each contractor and required them to complete the jobs prior to being assigned a new batch of jobs. This continued until construction managers had confidence in the contractors' ability to schedule and manage jobs and meet program timelines.

This initial methodology of assignment was crucial to identifying contractors who were not capable of handling the quantity of small jobs at the quality required by this Program. As a result, two contractors were never issued a second batch of jobs due to non-performance. It took a significant amount of time to complete and resolve the five jobs given to each, and it would have been costly to the Program if more jobs had been assigned.

Another contractor, who had promised they could handle up to 50 jobs per week, was given several batches of jobs of increasing size until they reached 22 in one batch. With this batch, it became evident that they were not able to handle the volume or level of detail required, and after these jobs were completed (3 months later), they were assigned smaller batches more in line with their capabilities.

Construction Management Tool (FACET™)

FACET™ was an important tool to effectively manage and track jobs. For the volume of jobs constructed in Power Savers, any manual method of tracking would have been overwhelming. The database design behind FACET™ was truly the key to success, as any query desired could be developed, and current status could easily be obtained.

Automatic Invoicing

Another key success factor, which removed a huge burden from the contractors, was that they did not have to submit invoices for the incentive amounts after jobs were completed and signed off. Through the use of FACET™, Newcomb Anderson Associates generated invoices automatically for prompt payment of incentive amounts due at every month's end.

6.3 Suggestions for Improvements

Adjust Unit Prices to Remove Inconsistencies

The drawback to using contractor bids in conjunction with statistical analysis to establish a pricing structure was that there was some inconsistency from measure to measure that did not reflect actual differences in costs. An example is the difference between the labor charged to install a CFL ($5) versus an HIR flood lamp ($7.72).

Technical Specifications

The technical specifications and other related documents should clarify for contractors the difference between low, normal, and high ballast factors. This was a source of much confusion for contractors, who frequently confused the terms "power", "power factor", "ballast factor" and "output". Various Program documents (technical specifications, price sheets, FACET™ reports) used these terms loosely, which added to the confusion. Adding a paragraph in the technical specifications to define the terms and ensuring consistency throughout documents would likely alleviate the confusion.

Require Contractor Submittals Prior to Use of Material

The Program could have required the contractors to provide manufacturers' cut sheets for all materials they planned to use. This may have alleviated some discrepancies between ballast powers. This could have been done once in the beginning, and only been required if contractors were going to substitute material.

As-built Documentation

Require contractors to provide some type of as-built documentation, e.g., requiring them to record the number of ballasts by type, the number of lamps, and the number of CFLs used. This could be accomodated somewhere on the completion paperwork or on a form provided by the Program. This would serve as a check against the quantity installed and would flag potential QC issues. This would be easy on small jobs, but could be difficult on large jobs, so some consideration should be given to the size.

6.4 Results

Table 6.1: Total Measures Installed and Approximate Savings, by Type

Description	Qty	kW Saved
Standard Fluorescent Fixtures	50,184	2,530
Compact Fluorescent Lamps	62,023	3,372
New Fixtures	477	40
HID and Incandescent Measures	1,409	35
Exit Signs	766	31
Program Total	**114,859**	**6,008**

Table 6.2: Total CFL Drop-off Sites, Quantity Installed and Demand Saved

No. of Businesses	201
No. of CFLs Installed	35,696
Demand Saved (kW)	2,209.5

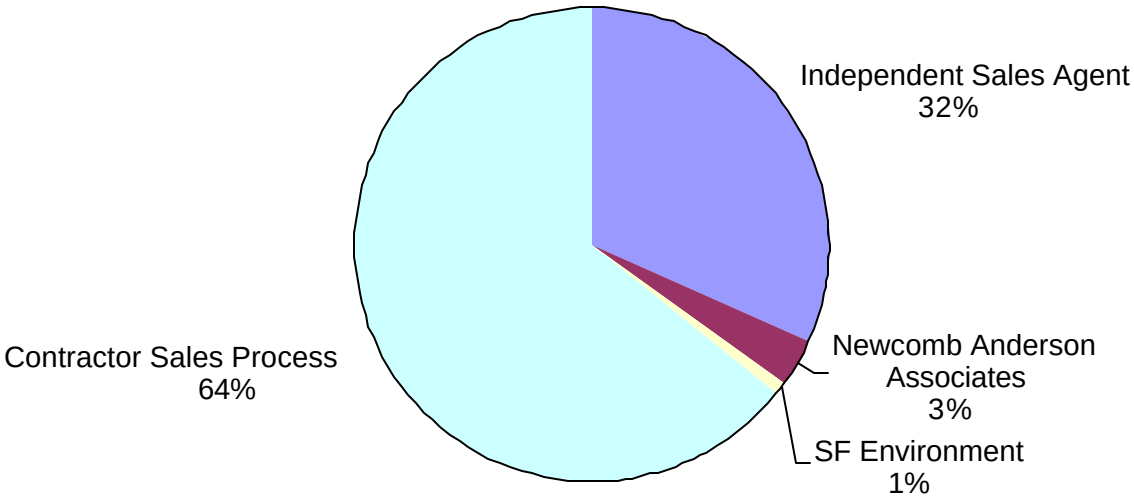
Table 6.3: Total QCs Performed

	No. Jobs	QCs Performed	
		Qty	Rate
Program Total	4,069	862	21%

NEWCOMB
ANDERSON
ASSOCIATES

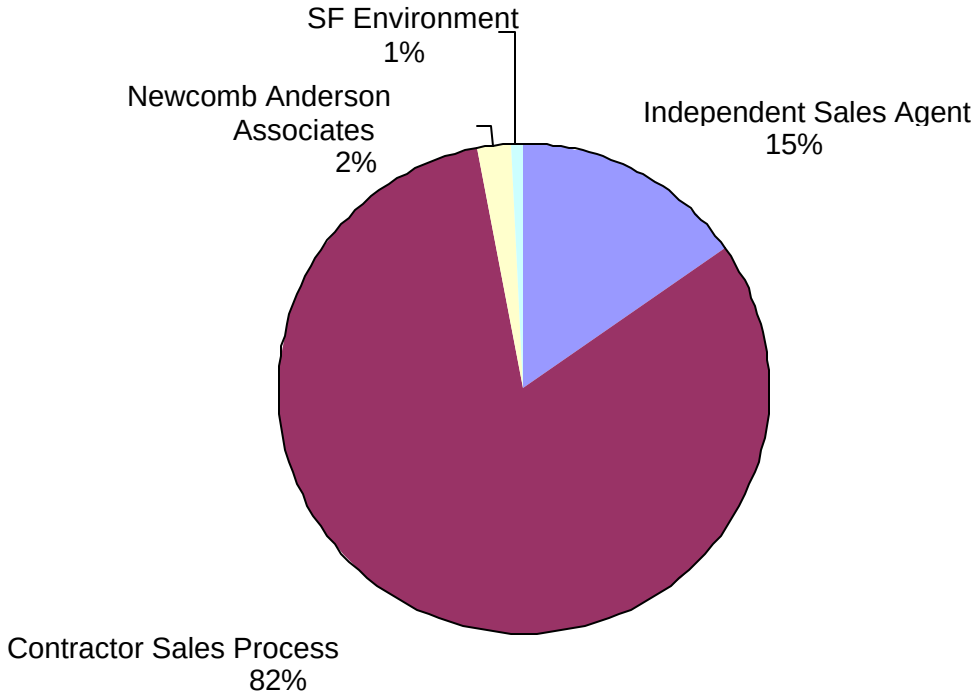
APPENDIX
Results by Sales Source

Power Savers
Completed Surveys by Source



Power Savers

Installed Jobs by Sales Source



Power Savers

Demand Savings by Sales Source