Small Grants Help to Boost Peak Demand Savings in California: Implementation and Program Administration of the California Energy Commission's Innovative Peak Load Reduction Small Grants Program

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ABSTRACT

In the wake of the California energy crisis, the California Energy Commission (CEC) launched a variety of peak load reduction programs with the objective of rapidly achieving demand savings to avoid blackouts. One of the more successful programs was the Innovative Peak Load Reduction Program (IPLRP). This paper presents an overview of the Small Grants Program component of the IPLRP.

The CEC outsourced program administration of the Small Grants Program to XENERGY. The IPLRP small grants were initially set aside for projects that ranged in size from 20 to 400 kW in peak demand savings. With an initial $10 million budget for small grants, the CEC increased funding to $14 million in response to the success of the program. With the additional $4 million in funding and close of the large grants portion of the IPLRP, the small grants program began to accept applications for large projects with peak savings greater than 400 kW. In less than a year, more than 330 applications were received and 183 Grant Agreements had been processed representing projects with more than 35 MW in potential peak demand savings. Program participants represented a variety of different business types and geographic locations throughout California.

This paper provides an overview of the Small Grants Program and reviews program design, marketing, characterization of the applicant pool and proposed peak reduction measures, and the estimated program accomplishments. Additionally, it reviews lessons learned from administering a program of this magnitude on a statewide basis. Lessons learned from the small grant program can help to shape future programs targeted at the nonresidential sector.

Introduction and Background

In response to the California energy crisis and skyrocketing wholesale prices for electricity, the California State Legislature passed Senate Bill X1 5 (SB 5X) and Assembly Bill X1 29 (AB 29X) that provided $859 million in funding for statewide energy efficiency programs. The California Energy Commission (CEC) was assigned the difficult task of administering some of the resulting programs and launched a variety of peak load reduction programs with the objective of rapidly achieving demand savings to avoid rolling blackouts. One of the more successful programs initiated by the CEC was the Innovative Peak Load Reduction Program (IPLRP) – a catch-all program designed to tap into the creativity of the private market to facilitate projects that reduce peak demand. This paper provides an overview of the small grants program component of the IPLRP.

Due to the resource-intensive nature of programs serving smaller customers, the CEC outsourced program administration of the small grants program to XENERGY. Within 6

weeks, XENERGY launched a mass statewide marketing campaign, developed a Policies and Procedures Manual for the Small Grants Program, drafted legal forms and other relevant program materials, and implemented a database tracking system. With an initial $10 million budget for small grants, the CEC increased funding to $14 million in reaction to the overwhelming response to the small grants program. Since the program's inception in May 2001, 337 applications have been received, representing projects that total approximately 70 MW in potential peak demand savings.

This paper presents an overview of the IPLRP small grants program and includes a discussion on the following topical areas:

- Program design;
- Marketing plan;
- Characterization of the applicant pool and peak reduction measures;
- Program accomplishments; and
- Lessons learned from administering the small grant program.

Small Grants Program Design

The small grants program targets small non-residential customers with projects in the 20-to-400 peak kW reduction size range. Grants are awarded on first-come, first-served basis at $250 per average peak kW. Early in the program, a bonus incentive was offered to encourage early project completion at $1 per kW for each day the project was completed before September 30, 2001. All projects are required to reduce summer peak electricity demand through September 30, 2004 (June 1 through September 30, 2 to 6 p.m.). Applicants are screened to see whether work has begun on their project prior to any detailed technical review analysis. Projects that have begun work do not qualify for a small grant unless they can demonstrate that they are accelerating the project schedule by at least a year. Grant recipients are required to pay at least 25 percent of the project cost. However, if the project cost is below $200/kW saved, up to 100 percent of the project cost can be awarded.

Eligible Projects

To be eligible for the small grants program, the project must reduce peak electricity demand or must generate electricity using a waste energy recovery method. Applicants are not allowed to double dip and receive funding from another utility incentive program for the same project. Eligible projects include:

- Projects that permanently reduce electrical demand of equipment that regularly operates during the peak period (2 p.m. to 6 p.m.) such as solar water heating to displace electric water heating, thermal energy storage, and efficiency improvements to lighting, motor systems or space cooling equipment;
- Projects that reduce the electrical demand of equipment only during the peak electricity demand period such as scheduled equipment curtailment using automated controls;
- Waste-energy recovery projects that augment electrical supply during the peak electricity demand period such as currently unused waste heat from an existing

industrial process; generation using landfill gas or micro-hydro turbines using head from an existing process.

Aggregation of Projects

The IPLRP is unique in California in that it allows multiple projects located within several utility service territories to be aggregated into a single application. Although aggregation of projects is allowed under similar utility-sponsored programs in California, no other program allows aggregation of projects located in several utility service territories.

As a result of this unique program feature, the Small Grants Program has been quite successful recruiting the participation of retail chains with multiple project sites located in different utility service territories throughout California. Additionally, the program was attractive to third-party contractors who were interested in providing services to small commercial customers because small projects could be aggregated to meet the minimum 20 kW project size requirement.

Application Processing and Account Management

Once an application for a small grant is received, the application is reviewed for eligibility and completeness and is assigned to an engineer for technical review and account management. The engineer performs a technical review to verify or revise the peak kW savings estimates. In some cases, a site visit is performed to verify base-case equipment or operating conditions. Once the kW savings estimates are agreed upon, the grant agreement is drawn up for both parties to sign and then the funding is officially reserved for the recipient. The account manager is responsible for monitoring the progress of the project and helping to facilitate project completion. If the recipient does not comply with the reporting requirements or terms and conditions of the grant agreement, their funding is at risk.

Grant Agreements

A grant agreement is the legal document committing funds to the project and is signed by the program administrator and the recipient. As program administrator, XENERGY has authority to negotiate the terms and conditions of the grant and to issue the grant agreement without CEC involvement. The grant agreement is unique for each project and includes a detailed project description, project location, estimated peak kW savings, estimated grant amount, project completion dates, and special terms and conditions for the grant. Additionally, project completion forms are attached to the grant agreement that outline specific documentation required upon project completion to verify project completion and peak kW savings. For instance, monitoring data may be required upon project completion to validate or adjust the actual savings achieved. Additionally, all recipients are required to submit full invoices related to the project with the Project Completion Forms.

Progress Reports

All grant recipients are required to submit monthly progress reports to update the account manager on the progress of the project as compared to the proposed schedule and

budget. The progress report should also document any proposed changes to project schedule, budget or scope of work.

Grant Payments

Grant payments are made after the project is complete and the recipient complies with the documentation requirements outlined on the project completion form. The actual grant amount will be adjusted to reflect any changes in the peak kW savings due to as-installed conditions.

Monitoring and Verification

To determine the grant amount, there is a calculated savings approach for the majority of projects in the Small Grants Program. However, in some cases, XENERGY requires pre and/or post monitoring to determine the peak savings resulting from the project and the final grant award.

The CEC has hired an independent measurement and verification (M&V) contractor that is in charge of estimating the actual demand savings realized by Innovative Program participants. This study is currently underway and involves the M&V of a sample of the participating projects to determine the actual MW reduction resulting from the project. At this time, no information is available regarding the ratio that exists between the approved and actual MW reduction.

Marketing Plan

The marketing plan for the Small Grants Program was developed and implemented by XENERGY with the primary objective of achieving maximum peak savings during the summer of 2001. The marketing efforts focused on increasing the general awareness of the availability of grant funding for peak load reducing projects. The IPLRP program was promoted as a statewide program to address current electric supply shortages and, more importantly, to help consumers offset rising energy costs by subsidizing peak load reduction projects in all end-use technologies. XENERGY identified the largest lighting and HVAC contractors and specifically targeted them in the marketing efforts. XENERGY also sought to establish partnerships with key industry associations, businesses with multiple facilities throughout California, and utility account representatives.

The marketing plan followed a three-part strategy as follows:

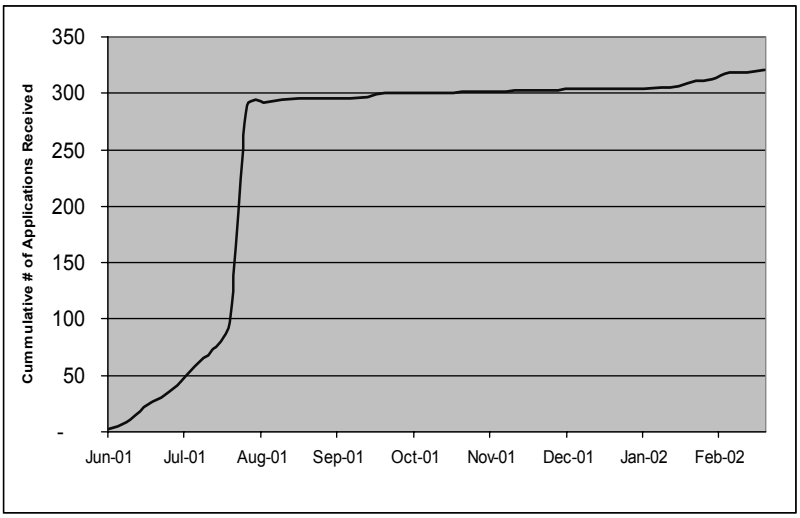
1. **Market segmentation** to develop a database of key end-use customers and principal supply-side actors who have the greatest potential for immediate program impacts. Account managers were assigned to the end-users and supply side actors that offered the greatest potential for programmatic impact by the end of September 2001.
2. **IPLRP Small Grants promotion** through marketing initiatives including direct customer contact, seminars, presentations, telemarketing, direct mail, telephone hotline and web site. Additionally, XENERGY developed co-marketing resources to extend marketing activities through other entities such as industry associations and trade groups.

3. **Support** for customer and supply side actors during the grant application process and project implementation activities.

Program Administration

Figure 1 displays the cumulative number of applications received by month for the Small Grant Program. The Small Grants Program initially had a July 31, 2001 application deadline. As displayed, leading up to the deadline, very few applications had been received. However, in the two days prior to the deadline, 193 applications were received.

Figure 1. Cumulative Number of Applications Received



Application Processing Procedures

The large influx of applications on the application deadline created a problem with an over subscription of program funding. Since applications were processed on a first-come first-served basis, only some of the applications that were received at essentially the same time on July 31 could be processed and the remaining applications had to be placed on a waitlist. XENERGY established a three-person committee to review and prioritize the 116 applications received on July 31. These applications were reviewed based on the following criteria:

1. Completeness of the application;
2. Expected completion date;
3. Level of certainty of demand savings;
4. Reliability of load impacts;
5. Project feasibility; and
6. Effective use of funds.

Each application was reviewed based on the criteria listed above and assigned a priority ranking of A, B or C. Applications in group "A" were processed after the applications received prior to July 31st, followed by group "B" and then by group "C". These

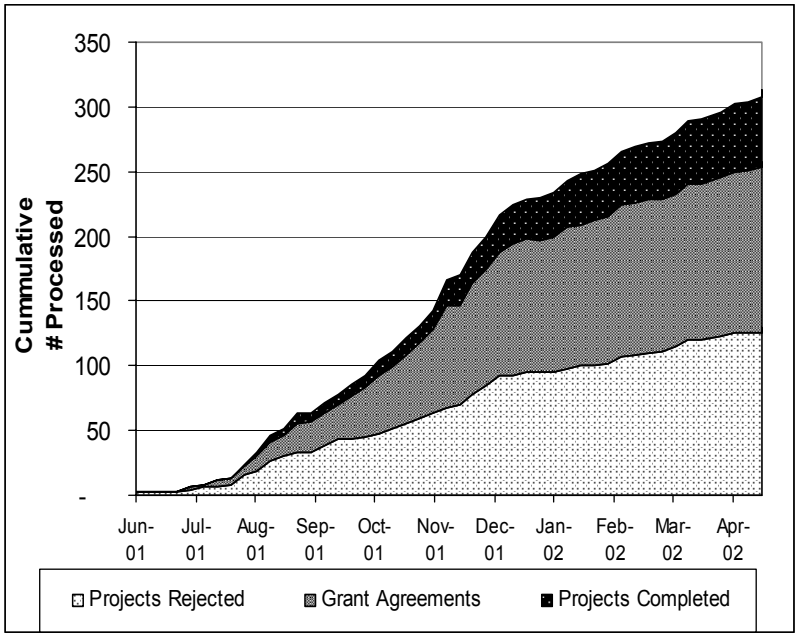
applications were sorted within their groups by estimated earliest completion dates and processed in that order.

The $4 million augmentation to the initial contract alleviated the problem of the waitlist. With the additional funding, we were able to process all applications that were received by the deadline and the rules were changed so that we could accept new applications until program funding was fully subscribed. By the end of April 2002, 321 applications were received, representing projects with potential peak demand savings of 68.1 MW.

Applications Processed Over Time

Figure 2 displays the cumulative number of applications processed over time. The length of time required to process an application varies depending upon the completeness of the application, whether a site visit is required, and the degree of technical review required. By the end of April 2002, 183 grant agreements had been processed, 130 projects had either been rejected or cancelled, and 55 projects had been completed and awarded the grant. Thus, over one third of our applicant pool were rejected or cancelled on the front-end of the program. Projects were rejected for a variety of reasons including program ineligibility, incomplete documentation and lack of response to our requests for information. Due to economic or other extenuating circumstances, applicants cancelled their projects. The number of projects canceling due to economic reasons increased significantly as the economy took a downturn in the fourth quarter of 2001.

Figure 2. Cumulative Number of Applications Processed

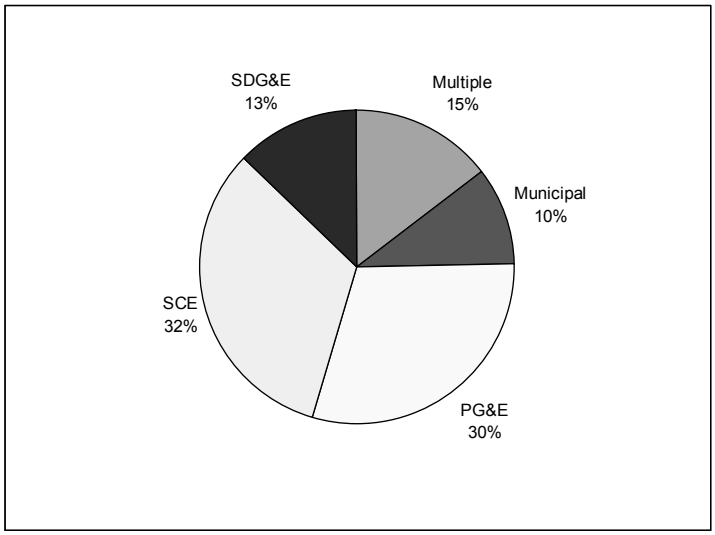


Characterization of the Applicant Pool

The applicant pool represented a diverse group of businesses located throughout California. Figure 3 indicates that the Small Grants Program was successful in recruiting

participation from businesses located in all of the major IOU service territories and a variety of municipal service territories. Additionally, approximately 15 percent of the applications were for projects with multiple sites located in several utility service territories.

Figure 3. Distribution of Small Grants By Utility Territory



The Small Grants Program was also successful in recruiting a number of different types of businesses into the program. As displayed in Figure 4, the majority of applicants described themselves as corporations. It's interesting to note that local governments and nonprofit organizations represent approximately 10 percent and 8 percent of our applicant pool, respectively. The "other" category is comprised mostly of public entities including special districts, schools and various other public agencies.

The breakdown of projects by project size is displayed in Figure 5. Although the program was originally designed for projects in the 20-to-400-kW range, applications for larger projects were accepted after the additional $4 million in funding became available. As a result of this change in program rules, projects with estimated peak savings exceeding 400 kW represent 35 percent of the grant funding awarded thus far. The breakdown of the number of grant agreements by project size is quite different. Almost one half of the grant agreements are for projects below 100 kW and 11 percent are for projects over 400 kW. The average project size is 180 kW, representing a $45,000 grant award.

Innovative Projects

The following section highlights a few particularly interesting and innovative projects that have been approved for small grants.

Greater Fresno Area Chamber of Commerce. The Greater Fresno Area Chamber of Commerce (GFACC), in conjunction with the Fresno County Workforce Council, conducted an energy conservation awareness campaign during June and July 2001 in response to the Summer 2001 California statewide electric reduction effort. The work consisted of on-site

energy information surveys (called Level 1 surveys) with an offer to complete a more in-depth on-site energy audit. These in-depth energy audits (Level 2) consisted of basic lighting and air conditioning surveys using standard energy calculations with some customizing of the process in the field. In total, about 1200 Level 1 and level 2 site surveys were completed (20-25 percent being Level 2).

Figure 4. Small Grant Applicant Pool By Type of Business

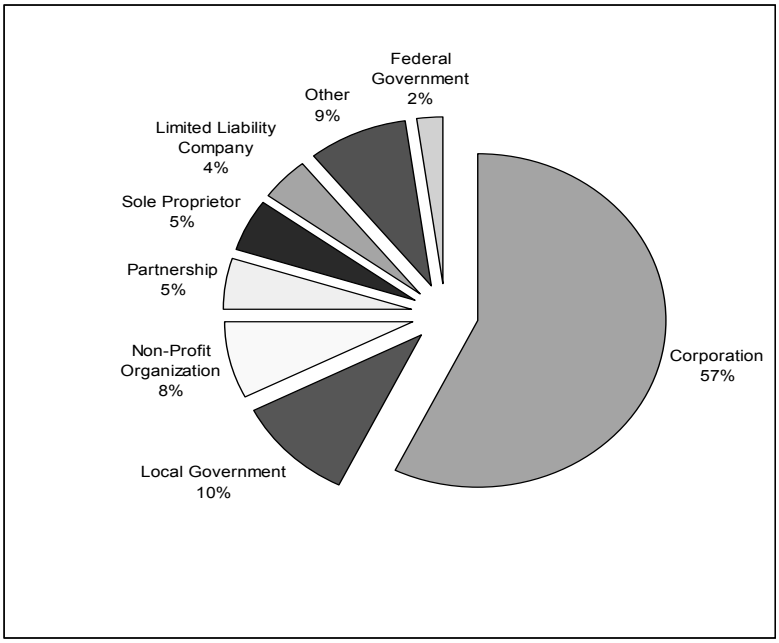
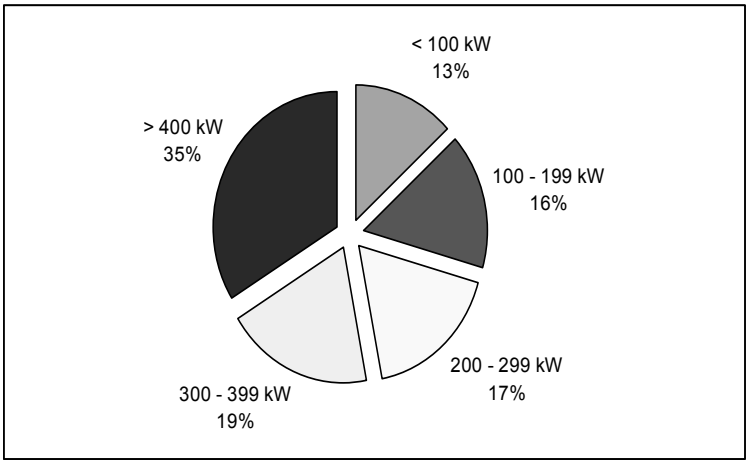


Figure 5. IPLRP Grant Funding By Project Size



During the course of the campaign, the field team observed that many of the small retail and offices sites were still using standard T12 lamps and ballasts (sites targeted in this program were 10 years older or more.). In addition, they were continuing to install T12 lamps when the old ones burned out. Field surveyors found that approximately 85 percent of the

contacts in these facilities were unaware of the utility rebate programs, state grants, and energy management retrofit technologies.

As a response, the GFACC proposed a direct install small commercial program. The GFACC project aims to provide premium T8 lamp and ballast technology, combined with de-lamping, to achieve significant energy savings. In this method, a three- or four-lamp T12 fixture is retrofitted to a two-lamp T8; one- and two-lamp T12 fixtures are retrofitted to a 1-lamp T8.

Identified businesses were aggregated into the program, and thereby are able participate in the SB5x grant program. The minimum kW reduction to be part of the CEC SB5x grant is 20kW, and since most of the targeted businesses for this application are small they would not have qualified on their own. Also, by aggregating the businesses, the GFACC was able to place the project scope of work out for bid as a direct install program. They received extremely competitive bids on labor and equipment, especially because the work started in January of 2001, which appealed to local contractors and suppliers in the difficult winter months. All these factors combined to be able to offer their clients prices of nearly $10 to $15 per retrofit fixture, utilizing the grant money and funding from the GFACC to offset the remainder of costs.

The project is a three-part project, with each phase being equal to approximately 300kW. The GFACC funds the work through a bond and grant payment is made upon project completion of each phase.

CFLs in Retail Space

Retail chains typically use PAR halogens ranging from 100W to 50W lamps. Many retail chain companies have applied to the CEC program to retrofit their high-wattage halogen lamps to lower wattage halogens (down to 50W). However, there exists a 23W compact fluorescent that is intended to produce the same light that the halogens provide for retail. Some of the retail chains have chosen to try the compact fluorescent for their lighting. One retail chain used compact fluorescents in varying configurations and fixtures with great success.

Process Upgrades to Woodworking or Milling Machines

Several applications that were approved were for process upgrades to woodworking or milling machines that are connected to central dust collecting systems. Normal operation has the fan motor running at full capacity to evacuate dust particles from the entire system based upon the CFM required for all woodworking machines and upon a minimum FPM to entrain the particles in the air stream.

The “Ecogate” system includes the installation of dampers or gates in the duct at each operating machine. Electronic sensors signal each gate to open only when that machine is cutting wood, or sanding wood. The sensor also signals the control computer to compute the new CFM volume of only the working machines and consider the static pressure loss based upon negative pressure sensors that are a part of the system. A signal is sent to a variable-speed drive installed on the fan motor to reduce the RPM to accommodate the significant reduction in necessary dust collection while maintaining the required FPM for proper evacuation of particles. The reduction in fan motor speed results in a sizeable reduction of

required energy. Typically the savings range upwards of 60 percent of the dust collection fan energy.

Estimated Program Accomplishments

Figure 6 displays the cumulative peak MW proposed, approved and completed in the Small Grant Program. By the end of April, approximately one year into the program, 37 MW had been approved for funding and completed projects resulted in approximately 5 MW of peak savings. The high number of project failures explains a large portion of the gap between the MW proposed and the MW awarded. The discrepancy between MW proposed and MW awarded is also due to the adjustment in peak savings estimates that takes place during the technical review process, both prior to approving the project and prior to approving payment. For instance, a large number of applicants did not apply a diversity factor to their peak savings calculations. Once diversity factors were applied, the estimated peak savings were adjusted downward prior to the project.

It is important to note that the amount approved in the Grant Agreement may differ from what is actually paid out. For example, based on technical review, a project may be approved for 100 kW peak savings and a $25,000 grant. However, once the project is complete, the actual peak savings may be different than the specified savings in the Grant Agreement. The recipient will only get paid for the amount of peak savings that is verifiable at the end of the project. As stated previously, XENERGY uses a calculated savings approach in most instances to determine peak savings. Invoices and other project completion documentation are reviewed thoroughly. Post-inspections are performed on approximately 10-20 percent of the completed projects to verify operating conditions and the equipment at the site. As of the end of April, the realization rate between MW approved and MW completed was 76 percent.

Peak Reduction Measures

Figure 7 displays the breakdown of the peak reduction measures proposed as compared to projects that were approved and completed under the Small Grants Program. Lighting efficiency measures account for approximately 65 percent of the total peak kW savings approved. The most common lighting efficiency measure proposed was retrofitting T12s and magnetic ballasts to T8s with electronic ballasts. Other common lighting efficiency measures were incandescent lighting to compact fluorescent lights in recessed lighting fixtures in retail space, delamping and the conversion to LED exit signs. Several projects proposed the use of lighting control strategies such as occupancy sensors or the use of dimming ballasts in areas that have daylight to reduce lighting levels by a central control during peak periods.

Figure 6. Cumulative MW Proposed, Approved and Completed

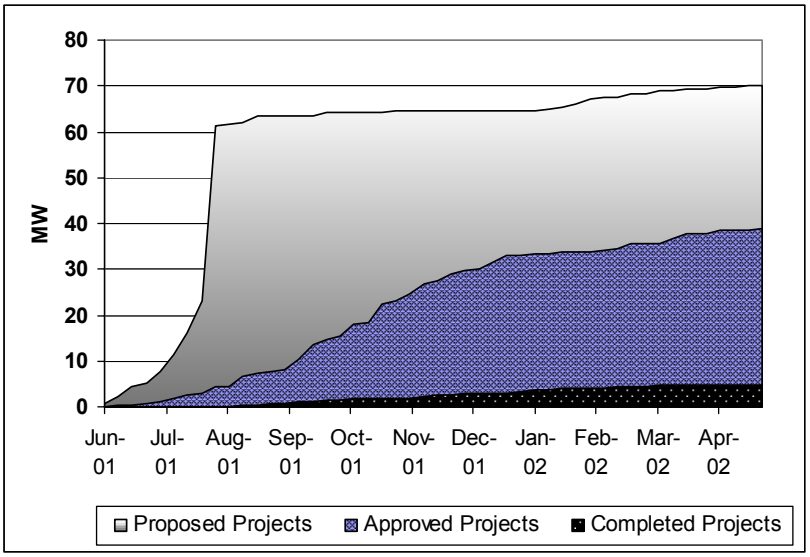
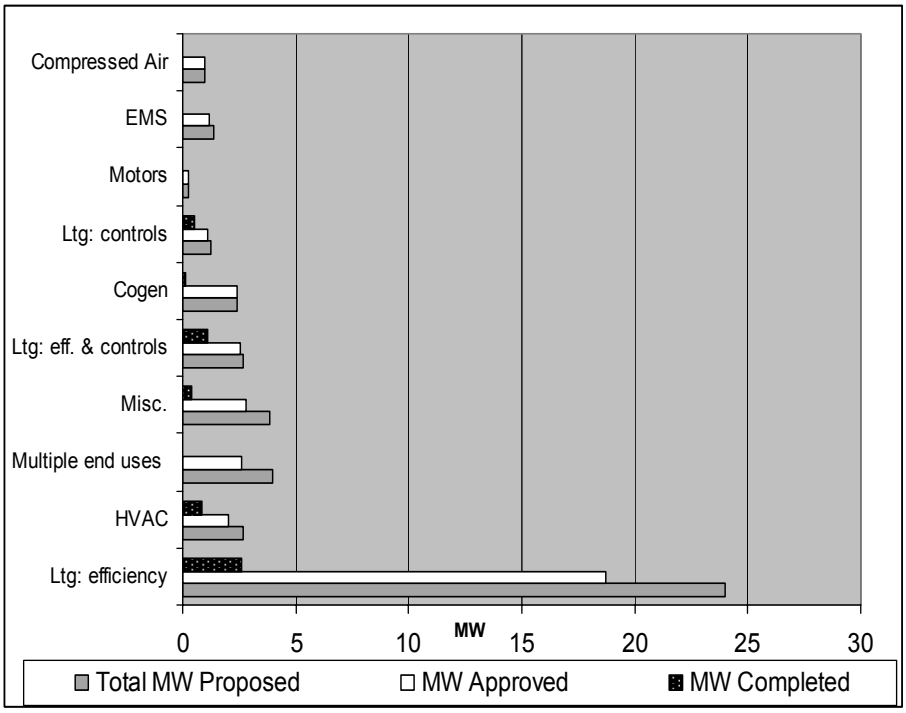


Figure 7. IPLRP Small Grants Estimated Savings by End Use



Not surprisingly, HVAC was the second most common end-use measure proposed, representing approximately 15-20 percent of the total peak MW proposed. However, HVAC projects represent only 6 percent of the total approved MW as of the end of April 2002. This is partially due to the longer lead time required to process HVAC applications because of the greater level of technical review and monitoring required. Additionally, applicants were much more likely to cancel HVAC projects than lighting or control projects, perhaps because they typically have longer payback periods.

Projects in the multiple-use category typically include a combination of lighting retrofits with other measures such as energy efficient motors, HVAC or chiller retrofits or replacements, process modifications and solar window film. These projects tend to require longer lead times to implement due to their greater level of complexity.

The miscellaneous category is a catch-all category that includes variable-speed drives, transformers, aeration system retrofits, battery charging system controls, and other measures that do not fit in any other category. These projects also tend to require longer lead times than the average project in the program.

Five cogeneration projects have been approved for a grant. Four projects propose to burn scrubbed gas in a microturbine, rather than flaring it to the atmosphere. The fifth project involves installing a new turbine generator to support water pumping activities.

Lessons Learned

Although the Small Grants Program evolved to allow applications for large projects, the original intent of the program, to serve the small nonresidential market, continues to be a primary objective. The small nonresidential market less is characterized by a number of significant barriers to the implementation of cost-effective energy-efficiency measures. These customers lack the expertise, staff, experience, time, and other resources to assess energy-efficiency opportunities comprehensively and confidently. From the perspective of the end-user, perceived hassle and risk are the two primary barriers that must be overcome.[1]

Actual implementation rates for even the most cost-effective, easily retrofitted energy efficiency measures is low in the small business market. For instance, the saturation level for interior 4-ft. T8 lamps and electronic ballasts and compact fluorescent lamps is about three times lower for the small customers (less than 50 kW demand) as it is for the large customers (greater than 500 kW demand). In addition, only 18 percent of small/medium customers say that they will replace their existing ballasts with electronic ballasts at burnout. This indicates that there remains a significant opportunity in the small market for high-efficiency lighting retrofits.[2]

Given that there is significant opportunity in the small nonresidential market for energy-efficiency products and services, lessons learned from the Small Grant Program can help shape future programs targeted at this market. The most important lessons learned from administering the IPLRP Small Grants are summarized below.

Aggregation of Projects Helps to Reduce Hassle and Market Transaction Market Barriers

The small grants program has been particularly successful in reducing the hassle and market transaction barriers relative to other similar programs in California. An important program design component is the allowance for aggregation of projects. Retail chains with locations in multiple utility service territories are able to submit a single application for projects at all of their facilities. Additionally, aggregating projects has allowed for the market penetration of smaller customers. Third-party contractors found this aspect of the program

[1] Evaluation of the 1998 Nonresidential Standard Performance Contract Program, XENERGY 1999.
[2] Ibid.

quite useful in facilitating their business with retail chains and other small business customers who could be aggregated to meet the minimum threshold.

Leverage Supply-Side Actors

Marketing to supply-side actors such as lighting and HVAC contractors and suppliers proved to be an extremely effective strategy. Early in the program, we held several breakfast seminars throughout the state to educate third-party contractors, vendors, and end users about the program. The seminars were scheduled at 7 a.m. so as not to interfere with the business day. We believe that this was instrumental in recruiting strong attendance at our seminars. Through successful networking, we were able to successfully leverage the sales forces of several third-party contractors who were quite active in promoting our program to their clients.

Application Deadlines Serves as a Strong Incentive

The application deadline served as a strong incentive to program participants to complete and submit their applications. Date stamping became important due to the large influx of applications received close to the deadline and the resulting funding limitations. Policies and procedures should be established to set guidelines for how to prioritize processing applications and what to do in the case that funding should become oversubscribed.

Technical Support is Key Program Component

We have found that a greater emphasis on education and technical support is required for smaller projects. Our telephone hotline and website proved to be effective customer support tools that were initially heavily used by prospective applicants. Many of the smaller customers or third-party contractors did not know how to do the savings calculations that were required to be submitted with the application. Engineers were available to provide telephone support. However, our scope of services did not include technical assistance in the field, i.e., audits or feasibility studies.

The hotline is still available and serves as a customer support tool that is available to facilitate the successful completion of projects. Consideration should be given to expanded technical assistance services, which may prove useful in promoting greater participation among the smaller, hard-to-reach customers.

Tap into Synergies With Other Energy-Efficiency Programs

The Small Grants Program strategically tapped into the synergies created by other statewide energy-efficiency programs. The *Flex Your Power* campaign, launched in response to the electricity supply crisis in California, proved to heighten awareness of the energy crisis and the need to reduce peak demand and energy usage. The *Flex Your Power* campaign included paid media and an organizational effort that reached state employees, local governments, businesses, and nonprofit organizations throughout the state.[3] The Governor

[3] The Summer 2001 Conservation Report,

sought the support of businesses, public agencies and nonprofit organizations who pledged to reduce energy usage by 15 to 20 percent during the summer months. The synergies between the two marketing efforts resulted in almost a 20 percent participation rate among local governments and nonprofit organizations in the Small Grant Program.

XENERGY also kept close tabs on the status of the funding in the investor-owned and municipal utility programs. The Large Nonresidential Standard Performance Contracting Program, run by the Utility Program Administrators[4] under the auspices of the California Public Utilities Commission, was fully subscribed early in 2001. As a result, we notified the three IOUs and their account representatives of the availability of funding in the Small Grant Program. Additionally, we marketed the Small Grants Program to municipal utility account representatives by highlighting areas in which the program complimented their existing programs.

Benefits of a Running the Program Again

Since additional funding was remaining in the Small Grants Program, a new solicitation has been launched and we are now realizing the benefits associated with running a multi-year program. The vast majority of the activity that we have seen under the new solicitation has been from applicants who participated in last year's program. Customers are submitting applications for additional projects at their facilities. Third-party contractors are continuing to market the Small Grant Program to facilitate project opportunities. Although there are many benefits associated with running a multi-year program, the incidence of free-ridership is likely to increase. Therefore, it is important to establish program rules, policies and procedures that are intended to minimize the incidence of free-ridership.

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