

**PGE2007 LARGE COMMERCIAL (Office Buildings, Government, Large Institutions)**

2006 - 2008

1. Projected Program Budget	\$73,932,258
See Tables in Attachment III for components	
2. Projected Net Program Impacts	
MWh	241,820
MW (Summer Peak)	56.493
Therms	5,009,468
3. Program Cost Effectiveness	
TRC	2.65
PAC	2.92

Gas savings forecast impacts are incorporated in the Mass Market, Agriculture and Food Processing, and Fabrication, Process, and Heavy Industries programs.

4. Program Descriptors

Market Sector: Large Commercial and Government Office Customers  
 Program Classification: PG&E  
 Program Status: New Program

The Large Commercial market sector includes large buildings where capital expansion, capital renewal, and/or operations and maintenance products and services are procured through contracts with manufacturers and/or distributors. The objective of the Large Commercial program is to provide the most cost effective and comprehensive portfolio of program elements for the targeted customers in order to deliver the kWh, kW, therms, demand response (DR), and distributed generation (DG) information for PG&E's energy procurement strategy.

The Large Commercial program seeks to involve customers, industry vendors and trade allies, third parties, technical industry consultants, and various partners (local, industry, state, national, and federal) in a cooperative environment that promotes energy management.

Local government partnerships (Partnerships) may be funded by this market segment. Each partnership will focus on the markets that offer the greatest opportunity for energy savings in their jurisdiction. A market-based approach is optimal because local governments are in the best position to understand the needs of local industries, business, and institutions. This approach will blend the benefits of common programs and a statewide strategy with the local knowledge of markets and barriers to traditional energy efficiency programs.

The program integrates the following third party offerings:

a) "Federal And State E5K Program", Energy Solutions; providing direct installation of high-efficiency (high color temperature) lighting in federal and state facilities.

b) "Monitoring-Based, Persistence Commissioning", Enovity, Inc.; providing remotely-monitored diagnostic controls for approximately ten commercial facilities. This program proposes to ensure energy efficient operation of building systems including lighting and HVAC by monitoring performance through diagnostic controls. Signals from these controls will be relayed to a system operated by Enovity, generating performance logs and directing maintenance and repair activities at each demonstration site.

c) "Customized Incentives For Food Processors And Refrigerated Warehouses", Onsite Energy Corporation; providing direct installation of energy efficiency measures for refrigerated warehouses (this program primarily serves customers in the Agricultural & Food Processing and Retail market segments).

d) "Enhanced Automation Initiative", KEMA; providing investments in enhanced automation and control technologies. The EAI targets large commercial customers looking to improve their building automation system and the functionality of their existing energy management system (EMS). The program offers free on-site assessments, technical assistance, and incentives for EMS reprogramming and/or hardware improvements.

It also integrates portions of the following partnerships:

a) Silicon Valley Leadership Group partnership.

Members of the Silicon Valley Leadership Group (SVLG) will be offered an integrated program through this partnership, featuring the installation of energy metering and monitoring equipment, identification of retro-commissioning measures, completion of retro-commissioning measures, and the identification and installation of retrofit measures. It is expected that qualifying projects will likely comprise predominantly office space uses for SVLG members. PG&E will coordinate activities with SVLG to ensure that the full portfolio of IDSM offerings is promoted to SVLG members, leveraging the influence of the SVLG.

b) Various local government partnerships.

Local government partnerships may, depending on final program design, offer services targeted at municipal facilities, including, but not limited to, retrofit incentives and retro-commissioning services. These projects will likely be modeled after the ongoing UC/CSU/IOU partnership. Retro-commissioning activities will likely be modeled after the Monitoring Based Commissioning program element; featuring installation of energy

metering and monitoring equipment, the identification and completion of retro-commissioning measures, and a training component for facility operations staff. Retrofit activities will similarly be modeled after the retrofit component of the UC/CSU/IOU partnership.

#### 5. Program Statement

The commercial sector uses about 36 percent of the electricity in the state. Office buildings are the largest single consumer of electricity within the sector, accounting for 28 percent of the commercial sector energy use.<sup>1</sup> Some large office buildings are managed by property management firms while others are owner occupied. City, county, state, and federal governments own and operate a substantial portion of these office buildings. New office buildings are constructed by owner/occupants, design/build firms, architects and engineers. All these entities, as well as the myriad of firms that support the construction, financing, maintenance and operation of office buildings, are targeted by this program.

The Large Commercial program marketing effort will include market integrated demand side management (MI DSM) products and services appropriate for the customers in this sector.

#### 6. Program Rationale

The large commercial market can be sub-segmented into categories useful to best delivering MI DSM products and services to the market. The two primary sub-segments are retrofit and new construction. While PG&E's products and services are not specifically differentiated in this way, it is useful to consider this difference in the approach to the market. New construction projects are most approachable by PG&E's calculated savings products, while retrofit projects may be best addressed by both deemed savings rebates as well as calculated savings products.

The large commercial market can be further segmented into:

- Private or public sector buildings (where investment horizons may differ drastically)
- Owner occupied buildings and campuses
- Buildings owned by large ownership and management firms
- Buildings separately owned but managed by large management firms

PG&E's market integrated program for office buildings will attempt to both overcome and eliminate owner, architect/designer, and tenant barriers to adopting higher

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<sup>1</sup> Xenergy, 2002. "Commercial Sector Energy Efficiency Potential Study". Oakland, CA.

efficiency technologies and practices in new and existing office buildings. A multi-pronged approach includes:

- Working with building owners/managers to educate them regarding the energy, environmental and financial benefits of introducing higher efficiency technologies in their buildings (including leasing, appraisals, and cash flow);
- Working with architects, engineers, and systems designers to make them aware of the full range of high efficiency options available to serve their clients, including the provision of tools and techniques that clearly identify the costs and benefits of including premium equipment, better operating and control strategies, and leading edge, integrated designs;
- Demonstrating how efficient technologies and design on a project can reduce tenant costs, generate an income premium for owners, increase worker productivity, and minimize life-cycle cost for both commercial real estate and institutional owners; and
- Working directly with the manufacturers of HVAC systems, lighting systems, and equipment that represent the major additions to plug load within offices.

PG&E currently operates a number of separate programs that address each of the groups listed above. This market integrated approach aims to build on that past work by bringing the approaches together under one umbrella to concentrate effort on activities that will yield the greatest long term savings and will foster more consistent transfer of information on new technologies and approaches.

Office buildings contain technologically complex, interactive systems that require sophisticated modeling to determine how those systems affect energy performance. Some building owners, property management firms, facility managers, architects and engineers need assistance to determine the most cost-effective energy efficiency design or retrofit. Others may know what they want to do for the energy efficiency while needing assistance with integrating renewable energy projects or demand response capabilities into their buildings. Still others may have financial constraints that inhibit their ability to implement their desired projects. The flexibility of the market integrated approach will allow PG&E to more efficiently deliver savings to a broader customer group.

## 7. Program Outcomes

The major goal of the program is to meet the energy savings target set for the program and identified above in Section 2. Beyond those kW, kWh, and therm savings targets PG&E has the following objectives for this program:

- Continue to work directly with architects, engineers, and systems designers in specifying high efficiency technologies and maximizing the potential of

integrated design. PG&E will introduce the program concepts to a large percentage of the major architects designing large office structures in the service area by 2008;

- Help building owners/managers save energy by directly increasing the efficiency of their existing facilities as remodeling occurs. PG&E will enlist city building departments in identifying remodeling candidates for which improvement opportunities exist;
- Work with building managers to include retro-commissioning in older office buildings. PG&E intends to include at least 5 million square feet of major office buildings into retro-commissioning projects as demonstrations for the larger office building community;
- Use energy service companies (ESCOs), industry insiders, and end-use experts (e.g., in lighting or HVAC) for outreach and delivery of an integrated mix of PG&E and third party program offerings with particular focus on commissioning and retro-commissioning services;
- Include evaluation of DG information and program options in all major new construction and retrofit plans, where applicable; and
- Promote demand response strategies, particularly as part of monitoring- based commissioning activities that may afford more cost efficient introduction of control technologies that will serve both energy efficiency and demand response ends.

## 8. Program Strategy

By combining previously stand-alone program offerings into one vertical market segment oriented to the unique needs of target customers, gaps and overlaps that existed among program elements can be resolved, resulting in a much more effective approach. Program administrative costs can also be reduced by achieving economies of scale and by combining systems and staff functions. Wherever possible, PG&E will strive to deliver Large Commercial program elements that are consistent on a statewide basis. PG&E will also work to adopt Best Practices from similar national integrated demand side management programs. The following portfolio of products and services will be coordinated for target market segments:

1. **Education and Training.** The Large Commercial program will coordinate Education and Training activities to best meet the needs of the market. Education and Training activities, especially early in the implementation of a new program, are critical to lay the groundwork for customer investments in energy efficiency and energy management.

The Program manager and assigned team will serve as a conduit to give strategic direction to Education and Training program for target markets, and will act as a

continuous feedback loop for ongoing program refinement. The integrated Education and Training resources will include:

- a. **Energy Audits:** On-site and other audit activities will be an element of the Large Commercial program.
  - b. **Benchmarking:** Benchmarking and self-assessment tools will be adopted or developed as an informational, motivational and strategic tool for customers and utilities.
  - c. **Commissioning and Retro-Commissioning:** Design assistance and on-site evaluations and activities will be available to the large commercial customers to ensure that energy efficiency equipment functions as intended.
  - d. **Codes and Standards:** PG&E will work to support the continued adoption of codes and standards covering a wider scope of end-use elements used in the large commercial sector and will continue work that ratchets up standards for end-uses covered within the current Title 20 and Title 24 standards.
  - e. **Emerging Technologies (ET) and Technology Demonstrations:** Targeted ET and demonstrations for large commercial customers will be delivered to the market through this integrated program.
  - f. **PG&E's Web- and phone-based Information Clearinghouse** will serve as a central, one-stop shop to deliver Large Commercial program information and services. It will also coordinate relevant non-PG&E tools and resources that are relevant to the market.
  - g. **Design Assistance and Energy Design Resources** - Use this well established statewide program to support the development of new design briefs, case studies, design tools, and training for designers and owners of medical facilities.
2. **Deemed Savings Rebates.** The Large Commercial program will assemble and deliver market-targeted information on PG&E's deemed savings rebates. The deemed savings component is expected to be a significant portion of the Large Commercial program savings delivery, particularly for smaller and mid-sized offices that are part of the program through their association with multi-site commercial property owners/managers who are formally targeted by the program. Design assistance service will also be offered in conjunction with deemed savings rebate options, as appropriate.
  3. **Calculated Incentives.** The calculated incentives approach will be offered for more complex or customized retrofit and new construction projects and will provide technical design assistance for customers. Program collaterals, offerings and incentive rates will be aligned with statewide programs such as Savings By Design to the extent possible.

4. **Demand Response.** The Large Commercial program will coordinate activities with internal demand response (DR) programs to integrate DR program offerings to better serve the customer and to maximize energy-related opportunities.
5. **Distributed Generation.** The Large Commercial program will coordinate activities with internal distributed generation (DG) programs to integrate DG technologies and program offerings, better serve the customer, and minimize missed opportunities.
6. **Low Emission Customer Services.** The Large Commercial program will coordinate with internal low emission customer service activities to provide this sector with access to those services PG&E has to assist with emission reduction or trading.

The Large Commercial program will use a team of experts and industry professionals to deliver energy efficiency services to the customer. This team will consist of market-dedicated PG&E employees, external consultants with market and/or technology expertise, contractors who work in this sector and third parties who may deliver components of the Program. Vendors may also deliver energy savings as project sponsors through the calculated approach or through deemed savings offerings. PG&E will remain the primary point of contact to coordinate the various program elements described above. The dedicated PG&E Program representatives will meet regularly with assigned large commercial customers, as well as partners and industry groups, to provide a continuous feedback loop required to track and adjust the Program as necessary.

It is anticipated that the Large Commercial program will employ primarily the calculated energy savings incentive mechanisms; however, upstream deemed or direct install measures may be used for the office equipment measures opportunity. Much of the energy savings will be oriented towards retrofit projects.

Budgets and goals described above account for the calculated savings associated with the Program potential. Budgets and goals for deemed savings and most Education and Training program elements have been accounted for in the Mass Markets and Education and Training program components. Local government partnerships ("Partnerships") may also be funded by this program.

PG&E plans to address new opportunities in its 2006 MI DSM offerings to the large commercial market. A major change for 2006 in the MI DSM products and services offered to the large commercial market sector is a new focus on office equipment and plug loads. Traditionally PG&E's offerings for this market have focused on the building shell; area lighting; heating, ventilating, and air conditioning; and ancillary pump and motor loads. New for 2006 is a focus on workstation loads such as computers, video display terminals, printers, external disk drives, computer audio systems, telephones, under-cabinet task lighting, copiers, and faxes. These loads are

growing to the point where they may equal the building load in power density (Watts per square foot).

For office equipment and plug load opportunities, commercial offices can be divided into two sub-segments, those that have continuous occupancy and those that have intermittent occupancy. For continuously occupied offices such as call centers or server farms, it makes sense to have the most efficient computer central processing unit, monitor, and task lighting that is economically available. For offices with intermittent use, where software sleep modes can save energy, it may make sense to encourage outlet strip level occupancy sensors to turn off task lighting and peripherals when office workers are temporarily away from their desks.

These offerings will be made in conjunction with PG&E new procurement guidelines activity, which works in conjunction with codes & standards advocacy to encourage large purchasers to voluntarily agree to procure high-efficiency products & services as a routine part of their procurement practices.

MI DSM improvement opportunities occur in conjunction with certain trigger events which may be:

- Review of building operation (controls tune-up, retro-commissioning)
- Operation and maintenance needs (such as equipment replacement)
- Re-capitalization (such as remodeling)
- Capitalization (such as green field development & new construction)

Early intervention during the design stage by the specialized engineers, contractors and consultants who serve these industries in the construction and renovation of facilities is especially important. The overarching strategy is to continue to work with the design community to make them aware of the value of integrated design strategies and the potential in high efficiency lighting, HVAC, and related technologies. This includes providing them with the tools to determine under what conditions the new strategies and technologies are appropriate, which approaches they can employ to move their clients, the building owners and managers, toward adoption of high efficiency technologies in the final designs. Interventions for the institutional sub-sector will be tailored to the unique funding and decision-making processes specific to that sector. PG&E will give particular attention to increasing communication within architectural firms so that a larger percentage of architects and designers within a given firm will foster high efficiency concepts and solutions.

In parallel, the program team will continue to work directly with building owners through its direct relationships with large property management firms, for example, California's Department of General Services (for state government-owned office buildings) and the Building Owners and Managers Association (BOMA). This work will focus on 1) building support for the United States Green Building Council's

Leadership in Energy and Environmental Design (LEED) and green building concepts and 2) in the case of government-owned office buildings meeting State government desires to reduce in government building energy consumption.

PG&E will work directly with large tenant groups that have known expansion plans in order to promote energy efficiency when selecting new office space. Both energy and non-energy benefits of high efficiency design options will be promoted. PG&E will provide tenants with specific information on the importance of controlling the growth in plug loads. This will include identification of equipment that can provide superior service and reduced energy consumption.

PG&E, ESCOs, and other third party market experts will provide calculated savings options as well as audits, information regarding distributed generation, demand response options, deemed savings rebates, and education and design assistance on the latest developments for managing energy. Education, marketing and energy audits will be specifically tailored to the various large commercial facilities and at the same time useful for most customers in each group.

Both retrofit and new construction efficiency improvements are often too complex to be pre-determined with a simple calculation. In addition, calculated savings approaches capture interactive effects of different end-uses to maximize potential savings. This is especially true in the more complex and varied workings of the large commercial facilities. Thus, the majority of savings for this market segment will be realized in calculated approaches. Deemed savings measures will also be available to capture simple projects and provide quick energy savings.

## 9. Program Objectives

As mentioned in Section 7 above the primary objectives of the Program are to meet the energy goals associated with the Program. The program-specific energy savings goals (for the calculated component) are provided above in Section 2.

Additional objectives support the long-range sustainability of market integrated DSM as a procurement strategy:

- Reduce program participation barriers and customer confusion by providing a single, coordinated, target set of program offerings that focus on long-range customer business needs;
- Adopt Best Practices in program design and delivery from our statewide partners in California, as well as other leading national energy efficiency programs;
- Ensure that the non-energy benefits of energy efficiency and market integrated DSM are captured and promoted across all market segments to fully integrate energy efficiency in the marketplace.

- Wherever possible, align the program with existing and complementary industry, local, state and national efforts (e.g., LEED, Green Building initiatives, CO2 reduction efforts, water efficiency programs);
- Optimize new construction design and specification practices amongst customers, architects, engineers and equipment vendors. Ensure that through education, training, and program interventions, energy efficiency in California becomes standard practice;
- Educate customers, designers, and vendors on existing and emerging technologies through seminars, classes, case studies, and technology demonstration;
- Promote increases in state energy codes and where codes do not apply, promote Best Practices;
- Facilitate technology transfer across program categories and industries; and
- Track program successes by establishing and continuously monitoring industry baselines and benchmarks on customer awareness, participation, satisfaction, and commitment to energy efficiency.

#### 10. Program Implementation

The market segment focus will allow program managers to integrate various demand side offerings into a tailored package most suitable to meet the needs of each particular sub-market. Direct install approaches will be used for very small customers. Traditional rebates will be available where particular high efficiency options can be clearly identified and promoted to a large cross-segment of customers.

PG&E's large commercial facilities consultants as well as ESCOs, contractors, third parties and others working on behalf of the program will meet with building owners and their architect/design teams to identify their specific energy needs: additional information/education on recent industry developments, site specific energy audits, energy efficient retrofit options, retro-commissioning, or new facility design assistance. Working together, they will develop a comprehensive energy efficiency plan which also considers options for distributed generation and demand response. For instance, as the result of discussions, a large property management firm might be interested in investment grade audits for existing facilities and assistance with the design of a major new high rise. PG&E would then link the customer with the appropriate resources and provide help to use this program.

PG&E will also coordinate with state and national efforts (e.g., the California Energy Commission's Public Interest Energy Research, the Environmental Protection Agency's ENERGY STAR<sup>®</sup> program). Trade associations (e.g., BOMA) will be linked into the entire package for education, outreach and lead generation. Additional financing may be offered if necessary and feasible.

Coordination with national efforts will focus on plug loads in office building, an increasingly larger share of total consumption. Careful design can minimize the increases in plug load for ancillary lighting and heating. However, reducing the growth rate of plug loads demands much closer attention and improved working ties to computer and office equipment manufacturers and distributors so that tenants are made aware of the true costs of inefficient plug load devices. PG&E's program staff and emerging technologies staff will work with office equipment manufacturers to both increase the efficiency of office devices and encourage customers to take greater care in their selection of office equipment.

The program will focus on the critical peak load areas of lighting, HVAC, and plug load end uses. The following measures will continue to play a large role in retrofit activities:

- Lamp replacement
- Ballast/fixture replacement
- High efficiency emergency lighting (new measure)
- Occupancy sensors
- Photocell and/or astronomical time clock controls
- Variable frequency drive air distribution boxes
- Office plug load related measures smart outlet strips, cube occupancy sensors, flat screen monitors, 80+ efficiency CPU power supplies)

Increased attention will be given to minimizing lighting loads in hallways, staircases and parking garages, as well as providing higher efficiency lights in common areas and introducing more sophisticated control technologies. Multi-level switching for lighting holds large potential and will be pursued where appropriate. Plug loads, including computers and copiers have large standby losses. Occupancy sensors in individual worker cubes that control all plug loads for individual workers hold potential and will be further evaluated and promoted.

HVAC systems will continue to be a large focus. Higher efficiency chillers and package AC systems, variable speed drives, variable air volume systems, increased use of economizers, and duct systems located in the floor are some of the key technologies that will continue to be pursued. Particular attention will also be paid to the introduction of distributed generation technologies that can save energy and reduce critical peak loads (e.g., microturbines with absorption chillers, photovoltaics).

Demand Response potential will be emphasized in applications such as hallway lighting and ornamental lighting. Some buildings are difficult because they can't reduce the HVAC load and still keep the occupants comfortable.

Some additional options are:

- Shutting down some vertical transportation such as elevators and escalators,
- Load cycling of air conditioning,
- Precooling of building,
- Temperature reset on chilled water systems,
- Raise cooling thermostat settings,
- Turn off equipment not in use and set computer equipment to sleep mode,
- Use daylight in the afternoon and turn off unneeded lighting, and
- Shut down vending machines for short periods of time.

PG&E's Emerging Technologies program will be used to scan the horizon for new, promising technologies and other opportunities. The most promising of these opportunities will be demonstrated to learn more about the benefits as well as educate potential users. An example of this is the energy saving and demand reduction opportunity associated with high color temperature, scotopic lighting. Recent studies have shown that office workers have better visual acuity with high color temperature lighting, allowing reduction in lighting levels (as measured by conventional photopic methods) and the resulting energy and demand savings.

## 11. Customer Description

The almost 107,000 large commercial government and private office buildings electric accounts consist of owner occupied office structures, buildings owned by large ownership and management firms, and buildings separately owned, but managed by large management firms. These office buildings serve both private and government needs often within the same physical structure. They range from one story wood frame structures to 50+ story multimillion square foot steel frame high rises.

Government and private office buildings represent almost 107,000 electric accounts. These accounts consume 9,700 GWh. The largest two percent of office accounts (those using over 200 kW) comprise 53 percent of the market segment.

Not unexpectedly, lighting and cooling end uses dominate this segment. Lighting accounts for 3,744 GWh of the segment's total consumption and 889 MW of peak demand. Cooling represents 1,716 GWh and 1,616 MW. Water heating is the dominant natural gas end use at 128 Mtherms annual consumption; space heating accounts for 98 Mtherms.

According to the most readily available potential study (KEMA, 2002) the total achievable energy efficiency potential over the next decade is 988 GWh (752 GWh from lighting, 166 GWh from cooling, and 64 GWh from ventilation), 344 MW (190 MW lighting, 149 MW cooling), and 7 Mtherms (4.4 Mtherms heating,

2.6 MTherms water heating). While these potentials may have been reduced somewhat by the latest update of California's Title 24 building standards and Title 20 appliance standards, substantial potential for energy efficiency exists in both the new construction and renovation markets for all customer size classes in the segment.

## 12. Customer Interface

The Office Building program will be presented to customers by PG&E account representatives, ESCOs, third parties, other industry consultants, and contractors/vendors of energy efficient equipment. Customers will also learn of the program through PG&E marketing efforts and in trade publications. The integrated market DSM portfolio will provide customers easy access to energy efficiency options as well as appropriate options and information for demand response and distributed generation.

## 13. Energy Measures and Program Activities

### 13.1 Measures Information

Many of the key measures for this program are discussed above. The cost effectiveness calculator contains end-use summary measures for the calculated incentive component of this Program. Traditional deemed savings elements are provided in the cost effectiveness calculator for the Mass Market program. Incentive levels for the targeted market programs are being developed to reflect current market conditions. PG&E is building on the statewide consensus of previous years to establish the rebate levels for the Mass Markets program that will reflect current market conditions.

### 13.2. Energy Savings and Demand Reduction Level Data

As noted in section 13.1 above, measure-specific energy savings and demand reduction level data are contained in the cost effectiveness calculators provided as part of the June 1, 2005 submittal. The end-use specific values provided in the Large Commercial program calculator are based upon historic values from the statewide programs such as Savings By Design. The achieved energy savings and demand reduction levels will be calculated for each project employing the calculated savings approach.

### 13.3. Non-energy Activities

PG&E's Energy Training Centers will provide training to architects, engineers and building operators on energy-efficiency and demand response.

PG&E's market sector lead will attend Building Owner's and Manager's Association meetings, as well as other organizations where key customers congregate. The market lead will maintain contact with key customers, developers, builders, and vendors in the

large building market. The focus of this contact will be to educate key decision makers about efficiency improvement and demand response opportunities.

Integrated audits will be offered to large buildings, where energy savings and demand reduction opportunities are identified and evaluated in terms that allow building decision makers to determine if improvements are merited. Referrals will be made to retrofit and other contractors who can provide energy services to implement recommendations. Follow-up to close the deal will be made by PG&E's Account Services Representatives.

Building operator training will be offered to certify these individuals with respect to their competency in achieving and maintaining control related energy efficiency.

#### 13.4. Subcontractor Activities

PG&E's portfolio of programs will integrate new and existing third parties as well as partnerships into each program. The major local governmental partnerships (e.g., East Bay Partnership) typically offer direct install activities for small and mid-sized nonresidential office buildings (among other building types). Some of the partnerships may also offer retro-commissioning activities that serve large commercial customers in their areas. Building commissioning and design experts have been and will continue to be employed by PG&E and its partners as subcontractors to deliver planned energy efficiency services. Third party subcontractors will also continue to be used for more localized direct install efforts that serve the small and mid-size commercial markets. Additional subcontractors are likely to be employed by PG&E when highly specialized services are required (e.g., installation of monitoring-based commissioning equipment, evaluation of site-specific distributed generation potential). The exact number and type of subcontractors will be determined after the third party bids have been selected and during the course of program implementation.

#### 13.5. Quality Assurance and Evaluation Activities

PG&E will continue the level of quality assurance of the present programs including pre-inspections for larger or specialized projects and post-inspections on all large projects and a percentage of smaller projects similar to 2004-2005.

The Large Commercial program has quality assurance verification activities and evaluations to ensure the program's efficiency and cost-effectiveness. The project verification, review and quality assurance will be carried out by independent consultants. PG&E will review and quality-check consultants' reports and customers' applications. Independent consultants' evaluations and program tracking data will be used to assess the effectiveness of program intervention strategies in order to meet customer needs and overcome market barriers.

The program evaluation consultants will gather data during the program interventions and review and conduct quality assurance on the data. The independent consultants will also supplement the data as needed to carry out the analyses to determine the successfulness of the program.

For measurement of energy savings, a detailed evaluation, measurement and verification (EM&V) plan will be developed by an independent consultant that will select methods that are consistent with the currently adopted measurement rules at the time the detailed plan is developed. Either in this evaluation or in an over-arching statewide study, the ex ante energy and demand savings estimates will be reviewed, and new ex post estimates will be developed if additional measurement is needed to assure accurate savings estimates. Savings estimates will be updated to reflect the best available information, as needed.

- **Process Evaluation:** This task will include evaluation of program delivery mechanisms, marketing and delivery channels, timelines and customer satisfaction. The research will provide ongoing feedback and guidance on program implementation through customer behavior and market actor studies. It will measure indicators of the program effectiveness. Surveys undertaken as part of the process evaluation are likely to include participating and non-participating customers and trade allies.
- **Market Assessment and Customer Behavior Analysis:** These tasks will assist in assessing customer awareness, behaviors and practices given their participation in the Large Commercial program. The data used will be drawn from the process evaluation survey of customers and from the verification data collected. The market saturation/market share/potential data from statewide studies currently underway will be another primary source of information for market assessment and baseline analysis.
- **Interim Impact Assessment and Feedback Analyses:** These tasks will provide ongoing feedback to program managers on the impacts being achieved. The analyses will let the program managers know early what measures are capturing large savings opportunities and what are not progressing and recommend timely program changes.

#### 13.5.1. Expected Number/Percent of Inspections (planned percent of projects)

The Large Commercial program will adopt an inspection plan to ensure that calculated measures are installed and operational. One hundred percent of the participating calculated projects are verified during an on-site visit as soon as a facility is substantially complete.

The inspection plan for deemed measures is addressed under the Mass Markets program.

13.6. Marketing Activities

This program will be one component of an integrated marketing and outreach strategy. A variety of channels (e.g., technical and program information, case studies, fact sheets, seminars, brochures, advertisements, point-of purchase materials, trade shows, direct mail, and articles in industry publications) will be used as appropriate. Particular emphasis will be placed on Web-based information and assistance.

14. Conclusion

This Market Integrated DSM program compliments the rest of PG&E's portfolio, contributes to the overall balance of the entire portfolio and is designed to achieve the Commission's energy savings targets.

15. Appendices

Documents shared with PG&E's Public Advisory Group and at the Public Workshops on the development of PG&E's 2006-2008 portfolio can be found on PG&E's Web site at [http://www.pge.com/rebates/program\\_evaluation/advisory\\_group/](http://www.pge.com/rebates/program_evaluation/advisory_group/).