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California Public
Utilities
Commission
(CPUC)
and
San Diego Regional
Energy Office
(SDREO)

Evaluation, Measurement &
Verification of the 2004-2005
Business Energy Services Team
(BEST) Program of the
San Diego Regional Energy
Office (SDREO)
CPUC Program #1285-04

Final Report

Submitted By:

 **Nexant**

August 2006

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San Diego Regional Energy Office (SDREO)

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Submitted to:

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8520 Tech Way, Suite 110
San Diego, California 92123

Submitted by:



Contact:

Terry Fry
tmfry@nexant.com
415-369-1021

or

Kevin Simmons
ksimmons@nexant.com
415-369-1013

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Executive Summary

This document represents the Final Report of the Evaluation, Measurement, and Verification (EM&V) activities of the 2004-2005 San Diego Business Energy Services Team (BEST) program, CPUC No. 1285-04, an energy efficiency local program provided for by CPUC Public Goods Charge Energy Efficiency Rulemaking R.01-08-028. BEST is a small commercial rebate program sponsored by the San Diego Regional Energy Partnership (SDREP) and administered by the San Diego Regional Energy Office (SDREO). The program implementer is KEMA, Inc.

The 2004-2005 BEST program completed 340 projects, representing 1,380 kW of net demand savings (26% of the program demand reduction goal) and 6.21 MWh of net annual energy savings (61% of the net annual energy savings goal). The program did not result in natural gas (Therm) savings. Although significant electrical energy savings were achieved in the program, the savings results fell somewhat short of the program goals given in the Implementation Plan, as shown in Table ES-1.

Table ES-1 Comparison of Project Savings to Program Goals

Metric	Savings Goals		Project Savings		% of Goal	
	Gross	Net	Gross	Net	Gross	Net
kW	--	5,375	1,663	1,380	--	26%
Annual kWh	10,580,000	10,158,643	7,481,104	6,209,316	71%	61%
Therms	32,322	31,029	0	0	0%	0%

The implementation of the Business Energy Services Team (BEST) program of the San Diego Regional Energy Office followed the original program design as outlined in the Program Implementation Plan.

The program administrator (SDREO) and program implementer (KEMA-Xenergy) received positive review comments from contractors for the conduct of various tasks and the overall implementation of the program. Contractors placed particularly high value on KEMA's role as program implementer. Customer participants placed high values on the various elements of the program, especially the energy efficiency educational information and the equipment procurement and installation process. Participants generally had little or no contact with the program administrator and so did not associate the BEST program with SDREO as strongly as might be expected or desired.

The program design was a rebate style "turn key" approach that placed significant emphasis on addressing market barriers of small businesses, such as the lack of capital for project costs, the lack of information on energy efficiency opportunities within participant facilities, and the uncertainty of energy savings and functional performance of energy efficiency measures. The program incentive pricing resulted in rebates that averaged \$0.20 per annual kWh savings and that paid for, on average, 71% of the project costs of the small business participants. The average project payback was 2.12 years.

The program was weighted significantly towards the resource acquisition of energy savings in the small business sector, and the program design and implementation plan included targeting hard-to-reach small businesses. Such hard-to-reach small businesses represented 91% of participants, and half of the participants that responded to a survey stated that they had never previously pursued an energy efficiency project.

The program had limited to no longer-term market effects on contractors or the overall small business sector of the participants. All program contractors stated in telephone interviews that they had included an energy efficiency focus in their marketing materials and project proposals prior to their involvement in the program, and the program did not increase the amount of energy efficiency projects most of the contractors had pursued outside of the program. The 340 projects included in the program represent a small piece of the tens of thousands of businesses in the small business sector, but a more significant share of the approximately 6,000 businesses in the eligible population of 20 kW to 100 kW customers.

The BEST program anticipates its successful completion within the original projected budget of the program. The program remained cost-effective based on a TRC Test ratio of 1.34 and a Participant Cost Test ratio of 5.11.

Recommendations for improvement to the program include the following:

- Remove the customer minimum demand eligibility criteria (20 kW) to allow a much greater population of potential customers, and to remove a burden on the contractors who must spend valuable marketing time selling the program before verifying that the customer is actually eligible to participate in the program,
- Implement an arrangement with the utility to provide a potential customer list to the contractors to expedite identification of potential customers,
- Streamline the application process and reduce the paperwork so that the contractors do not need to spend as much time completing the administrative requirements,
- Build stronger links and name identity with SDREO and leverage SDREO's other programs and resources,
- Consider additional labor costs, taxes, etc., in future standard measure pricing

It appears that the BEST program may have approached the saturation level of eligible customers. It was estimated by the program implementer that there are 4,000 to 8,000 eligible customers who fall between 20 kW and 100 kW demand and who are not on SDG&E's "A Rate" schedule. Including the current implementation period's 340 customers, the BEST program has brought in about 450 local customers since its inception in 2002. With an approximate 10 to 1 fail to success rate to enroll customers (an industry approximation), it would appear that most eligible customers must have been approached about the BEST program. It is safe to say that the BEST program has been successful at reaching their target market, and continuation of the program may result in diminishing returns as the saturation rate nears its peak. The BEST program has been a success, but continuation of the program in its current form is not recommended.

This document represents the Final Report of the Evaluation, Measurement, and Verification (EM&V) activities of the 2004-2005 SDREO Business Energy Services Team (BEST) program. The report summarizes the results of EM&V activities that were conducted during 2004-2005 as specified in the CPUC-approved EM&V Plan (Appendix A), in compliance with the CPUC Energy Efficiency Policy Manual within the constraints of the allocated budget for EM&V tasks. The 2004-2005 BEST program is a continuation of the BEST program that was originally implemented in 2002-2003.

On January 15, 2002, SDREO submitted a proposal to the California Public Utility Commission to administer an energy efficiency local program as provided for by CPUC Public Goods Charge Energy Efficiency rulemaking R.01-08-028. The title of the proposed program was “San Diego Region – Direct Install Small Commercial (DISC)” program. The CPUC awarded funding to SDREO to administer the DISC program, assigned to the program the CPUC local program No. 305-02, and in CPUC decision D.02-05-016, directed SDREO to closely coordinate marketing, incentive pricing, and customer participation databases with San Diego Gas & Electric’s (SDG&E’s) EZ-Turnkey program and SDG&E’s Small Business Assessment program.

On May 24, 2002, SDREO submitted to the CPUC the DISC Program Implementation Plan (PIP). Subsequently, SDREO and SDG&E entered into negotiations in an attempt to coordinate their respective programs. SDREO states that, due to limited time remaining to SDG&E before the deadline to submit PIPs, SDG&E directed SDREO to limit customer eligibility in the DISC program to exclude SDG&E “A Rate” customers, and to include as eligible small commercial and industrial customers with peak demands only in the range of 20-100 kW. The original eligibility requirements of the DISC program, as specified in the PIP, required small commercial customers to have peak demands of less than 100 kW and to be located in economically distressed areas. As a result of the directive from SDG&E, SDREO modified the eligibility criteria of the approved DISC PIP to include only small businesses with demand between 20 kW and 100 kW and to waive the requirement that participants must be located in economically distressed areas. This modification was implied in the statement “...eligible non-residential SDG&E customers need only have peak demands between 20 kW and 100 kW, to be eligible to participate in the San Diego Regional Energy Office's DISC Program,” which was communicated to CPUC Energy Division Staff in a letter dated August 9, 2002. The SDG&E EZ-Turnkey and Small Business Assessment programs would continue to target small commercial customers with peak demands of less than 20 kW.

During the program planning and start up stages, SDREO changed the program name to the “Business Energy Services Team (BEST)” program to eliminate the misconception that the program was a “direct install” program rather than a “rebate” program with a “turnkey” approach. The success of the 2002-2003 BEST program led to its continuation in 2004-2005.

BEST provides rebates for installing energy efficient equipment in small commercial applications in the SDG&E service territory. Eligible participants are businesses with a maximum electric demand between 20 kW and 100 kW; however, businesses on SDG&E’s Schedule A are not eligible. Eligible equipment includes indoor and outdoor lighting, heating

and air-conditioning system controls, window film, and other proven technologies. The program pays for all professional services and, depending on the technology, up to 100% of the total project cost. Applications were required to be submitted between July 23, 2004 and December 31, 2005, and projects must have been installed by March 31, 2006 to be eligible to receive a rebate.

Section 2 Evaluation Measurement & Verification (EM&V) Methodology

Evaluation, Measurement and Verification (EM&V) of the 2004-2005 SDREO BEST program consisted of many activities performed during and subsequent to BEST program implementation. The approved EM&V Plan is provided in Appendix A.

The EM&V process consisted of the collection and review of information and data resulting from the following activities:

- Review of program documents and development of a BEST Program Logic Chart
- Analysis of data in the Program Activity Tracking Database
- Telephone interviews with a sample of program participants
- In-person interviews with program administration managers and program implementation managers
- Telephone interviews with a sample of contractors
- Site inspection, direct measurement of operating hours, and analysis of claimed energy savings of a sample of completed projects

The assessment of the effectiveness of the program was based on the results of in-person and telephone interviews, tabulated results from the telephone survey of participants, and the quarterly review of data collected and inputted by implementers into the program activity-tracking database. Due to the limited budget, non-participants were not surveyed nor market effects tested beyond the sample of program participants. Details of the EM&V tasks are provided in the remainder of this section.

2.1 DEVELOPMENT OF PROGRAM LOGIC CHART

A 2004-2005 BEST Program Logic Chart, provided in Appendix B, was created to document program theory and design (e.g., objectives, market barriers addressed, promotion and delivery strategy, target participants, target measures, service offerings, projected inputs and outputs, and savings goals) and identified metrics to test the program theory and to gauge the performance of the program. The identified metrics delineated between short and longer term, and direct and indirect market effects, as well as savings impacts and cost-effectiveness.

Development of the chart was based on input from several sources, including:

- Interviews with the program administrator and implementer,
- Review of program documents (e.g., proposal, PIP, budget worksheet, etc.),
- EM&V results from the 2002-2003 BEST program.

The EM&V activities were subsequently designed to gather the information and data necessary to quantify and/or qualify program performance against the metrics identified in the program logic chart.

2.2 ANALYSIS OF DATA IN THE PROGRAM ACTIVITY TRACKING DATABASE

The program implementer designed and maintained a project activity-tracking database. Contractors populated the database as they initiated project proposals for customer participants in the program. The program administrator was responsible for documenting the status of proposals and projects as they moved through the various phases of the program (e.g., proposal initiated, proposal approved, customer acceptance, work order, etc.).

The data in the program activity tracking database was aggregated and analyzed to quantitatively evaluate program performance, such as number and types of participants, number of contractors and projects per contractor, total and end use-specific claimed annual gross savings (kW and kWh), project costs, rebates, average payback per project, etc.).

For a sample of projects, information collected during the site inspections and represented on requests for incentive payment was compared for accuracy with the data in the program activity-tracking database.

2.3 TELEPHONE SURVEY OF PARTICIPANTS

A telephone survey was designed and successfully conducted with a sample of 94 BEST participants. Two sets of participant telephone interviews were conducted, one in March 2005 and the other in July 2006. The 2005 interview reached 37 participants, and the 2006 interview reached 57 participants, for a total of 94 participants. Given the total population of 340 participants, the 94 participants surveyed exceeds the 90% confidence / 10% precision statistical accuracy goal described in the approved EM&V Plan given in Appendix A. Results from the two surveys have been combined for presentation purposes.

The survey questions are provided in Appendix D. The questions in the survey were selected to verify the program theory (e.g., market barriers for customers, valued service offerings, etc.) and to assess program effectiveness, participant satisfaction, participant market effects, stipulated values in energy savings calculations, and net to gross estimates.

Non-participants were not surveyed as part of the EM&V activities due to the limited allocated budget for EM&V activities.

2.4 INTERVIEWS WITH ADMINISTRATOR, IMPLEMENTER, AND CONTRACTORS

Five of the nine contractors that completed projects in the 2004-2005 BEST program were contacted for a telephone interview. The five contractors interviewed represent 326 of the 340 completed projects and, in aggregate, 95% of the BEST program energy savings.

In-person interviews with the program administrator and the program implementer were conducted at the beginning and end of the program. Results from the participant telephone interviews and from the administrator and implementer interviews are given in subsequent sections of this report.

2.5 SITE INSPECTIONS AND ANALYSIS OF CLAIMED ENERGY SAVINGS

The program implementer conducted pre- and post-installation inspections of all projects to verify baseline information and the installation of project measures as specified in project

documents (e.g., existing equipment inventories, proposals, work orders, project completion reports).

To test the accuracy of the information (e.g., claimed energy savings, installed measures, stipulated operating hours), EM&V activities included site inspection of a sample of 11 projects.

The site inspections had the following objectives:

- Verify installed equipment counts, types and capacities,
- Verify facilities were currently operating,
- Assess the appropriateness of the stipulated hours of operation,
- Assess comprehensiveness of project proposals,
- Assess the appropriateness/quality of the installed measures,

In addition, the analysis of the sample projects included a review of documents and claimed energy savings, based on the reasonableness of the stipulated operating hours. An attempt was made to examine the credibility of baseline assumptions (e.g., existing equipment numbers, type, and rated kW), when possible. The sample of 11 sites represents an 80% confidence level with a 20% level of precision, assuming a large defined population and a coefficient of variation of 0.5.

The 11 sites were selected at random from the population of 340 projects. The sites visited included lighting measures (T8 fluorescents, compact fluorescents, LED *Exit* signs) and refrigeration measures (evaporator fan replacement, door heater controls). More than 11 measures were observed during the inspections, as each project site contained multiple measures.

Results from the site visits are used to adjust the claimed (gross) energy savings. This is discussed in Section 6.3.

Process evaluation activities focused on assessing the BEST program design and implementation. The BEST program theory (e.g., objective, market barriers) and the elements of the program design (e.g., target participants, target measures, program services, promotion and delivery strategies, incentive pricing, etc.) were examined by reviewing program and project activity, characterizing program participation, and surveying contractors and participants.

3.1 LESSONS LEARNED AND CHANGES TO 2004-2005 PROGRAM

The success of the 2002-2003 BEST program demonstrated a clear need for the program to be continued. In the 2002-2003 program, there was a need for the program implementer to establish a waiting list of projects. Continuation of funding into 2004-2005 allowed the program to fund projects that were on the waitlist, as well as take advantage of program momentum. The 2002-2003 BEST program was kept largely intact for the 2004-2005 continuation. However, there were several aspects to the earlier program that were changed for the 2004-2005 program.

The 2002-2003 BEST program included incentive amounts that ensured projects met at least a 1-year payback period. For most measures, the incentive was tied directly to the project demand savings. However, contractors strongly pursued lucrative delamping projects, resulting in an average payback of 0.2 years and customer payment of about 8 percent of total project cost. The 2004-2005 BEST program was changed to reduce the incentives for lighting measures by about 15 percent. This adjustment was expected to result in almost a half-year payback period and customer payment of about 17 percent.

A second change to the incentive levels was to implement a cap based, in part, on whether the participating business qualifies as a hard-to-reach (HTR) business. If the business qualifies as hard-to-reach, there was no cap on incentives (other than project cost). It was decided that a cap would be applied to incentives for non-HTR businesses.

Finally, to encourage a healthy mix of measures (such as lighting and non-lighting), the program was to initially reserve funds per measures category. Also, the cap for non-HTR businesses was to be lifted for projects that included multiple measures.

3.2 OBJECTIVES

The BEST program objective was to “maximize implementation of cost-effective high efficiency lighting measures, while addressing some HVAC, refrigeration, gas measures, and other customized measures in the small business market.” The objective of the program did not change during the course of the 2004-2005 program.

The 2004-2005 BEST Program Implementation Plan identified the key objectives of the program:

- Cost-effective, proven results,
- Emphasis on peak-demand savings,
- Strong hard-to-reach, equity focus,
- Complete “turnkey” service,

- Maximum door-to-door marketing impacts,
- Incentive levels that work for the target market,
- Innovation and market transformation through education, and
- Leverage SDREO’s relationships with city governments in San Diego County.

3.3 MARKET BARRIERS

The program design lists the following market barriers that were to be targeted by the program:

- Lack of access to capital/first cost,
- High hassle or transaction costs,
- High information access and search costs,
- Performance uncertainty and hidden costs,
- Split incentives, and
- Access to financing.

In the telephone survey, customer participants identified “quantifiable savings,” “information access and search costs,” and “operating and hidden costs” as the leading obstacles to pursuing energy efficiency projects. These obstacles were defined in the survey as “Without assistance from programs such as BEST, the customer will not start energy efficiency projects because of this obstacle.”

The responses of customers to questions contained in the telephone survey about barriers to pursuing energy efficiency projects can be found below in Table 3.1. “Obstacle” was defined as “Customers may start energy efficiency projects without assistance from programs such as BEST, but the type, size, and timing of projects may be affected because of this obstacle.” “Not an Obstacle” was defined as “The listed obstacle does not impact customer decisions to pursue energy efficiency projects.”

Table 3.1 Customer-Reported Obstacles to Pursuing Energy Efficiency Projects

Obstacles to Starting Energy Efficiency Projects	Leading Obstacle	Obstacle	Not An Obstacle
Available cash capital	14%	59%	28%
Available financing/loans	13%	29%	58%
Hassle/transaction costs	14%	28%	59%
Information access/search costs	18%	21%	62%
Operating/hidden costs	17%	37%	46%
Functional performance	12%	37%	51%
Quantifiable savings	19%	34%	48%
Different project goals	10%	62%	28%

The program implementer and contractors identified a range of market barriers to pursuing energy efficiency projects for small businesses, including lack of knowledge and education about energy

efficiency opportunities and benefits, cash flow/upfront capital costs, and lack of trust in projected energy savings and the performance of measures.

The responses of the program implementer and contractors to questions asked during interviews about barriers to pursuing energy efficiency projects can be found below in Table 3.2.

**Table 3.2 Market Barriers to Small Commercial Customers
as Reported by Implementer and Contractors**

Program Implementer and Contractor Perceptions of Market Barriers
Lack of information about energy efficiency opportunities
Inability/lack of time to process information
First costs/upfront capital costs
Financing not available
Lack of trust of promised energy savings and performance of measures
Belief that nobody cares about them
Language barriers
Cultural differences in doing business

The design of the program effectively addressed the expected market barriers. Information about energy efficiency opportunities was disseminated by the contractors. The issue of trust was addressed by including face-to-face interaction with the participants, rather than relying on brochures or other marketing materials. The contractors also used word-of-mouth networking, targeting community leaders, to reach additional customers. The participation agreement provided legitimacy to the program, and the pre- and post-installation inspections addressed the concerns about the promised energy savings and performance of measures.

3.4 TARGET PARTICIPANTS

The approved Program Implementation Plan (PIP) for BEST describes the target participants as “hard-to-reach” small commercial customers in the SDG&E service territory. Meeting the definition of hard-to-reach (HTR), as defined by the CPUC, was not an eligibility requirement for participation. Program contractors did collect and input information into the BEST program activity-tracking database that corresponded to three of the elements listed in the CPUC’s HTR definition: less than 10 employees, leased facilities, or used a primary language other than English. Such hard-to-reach customers represented 91% of the participants in the program. The BEST program website, program brochure, and contractor training material did not include information that specified “hard-to-reach” customers as a target segment of the program.

Prior to implementation of the BEST program, the CPUC directed SDREO to work with SDG&E to coordinate BEST program activities and target participants with two similar SDG&E programs, the EZ-Turnkey program and the Small Business Assessment program. During the early stages of implementation, and resulting from negotiations with SDG&E, the eligibility criteria of the BEST program were modified to exclude SDG&E “A Rate” customers, to include small businesses with demand only between 20 kW and 100 kW, and to waive the requirement that participants must be

located in economically distressed areas. As a result, participants who completed projects in the program were located throughout SDG&E’s service territory.

The program implementer offers the following explanation of the impact of the change in eligibility requirements:

“The effect of making “A Rate” customers ineligible for the BEST program is to dramatically reduce the [available] market for the program and [to increase] the average size of the projects funded by the program. A crude estimate of customers was that there were approximately 80,000 to 100,000 “A Rate” customers, and approximately 15,000 to 20,000 nonresidential customers with kW demand between 20 and 100 kW. The impact of eliminating the very small customers from the target market in the SDG&E service area is illustrated in...[Table 3.3]...where the participation levels by rate schedule in the BEST Programs implemented in Long Beach, Oakland and San Diego [during 2002-2003] are shown. The Long Beach and Oakland programs targeted customers with kW demand below 100 kW. These two programs had high levels of participation by the very small customer segment identified by GS-1 and A-1 rate schedules for SCE and PG&E, respectively. For the City of Long Beach BEST Program, 62% of the participants were on the GS-1 rate schedule, while for the Oakland BEST Program 70% of the participants were on the A-1 rate schedule.”

Table 3.3 Comparison of BEST Programs Participation by Rate Schedule (1)

Utility	Rate Schedule	Description	Participants	Percentage
PG&E	A-1	Small General Service	211	69.6%
	A-10	Medium General Demand-Metered Service	45	14.9%
	A-6	Small General Time-Of-Use Service	40	13.2%
	E-19	Medium General Demand-Metered Time-Of-Use Service	7	2.3%
	Total		303	
SCE	GS-1	General Service, Non-Demand	63	61.8%
	GS-2 Non-TOU	General Service, Demand	35	34.3%
	TOU-GS-1	General Service, Non-Demand	2	2.0%
	TOU-GS-2	TOU, General Service	2	2.0%
	Total		102	
SDG&E	A	General Service	EXCLUDED	0.0%
	AD	General Service, Demand-Metered (Closed Schedule)	5	4.6%
	AL-TOU	General Service, Time-Metered	95	87.2%
	A-TOU	General Service, Small Time-Metered	9	8.3%
	Total		109	

(1) Provided by KEMA-Xenergy, 2002-2003 BEST program

Excluding “A Rate” customers greatly reduced the eligible participants in the program. However, it appears that excluding customers below 20 kW actually had additional negative effects on the

program. Contractors consistently reported that determining customer eligibility was a burden. It is often difficult to distinguish an 18 kW business from a 22 kW one without access to a utility bill. SDG&E refused to provide a list of customers over 20 kW out of privacy concerns. For any given small business, BEST program eligibility could not be confirmed until after contractors had spent time with them to provide them information and convince them to participate. This time and effort was often wasted when the customer was subsequently identified as having less than 20 kW demand. Contractors consistently identified the exclusion of 20 kW customers as a major burden and program shortcoming.

A diverse range of facilities were participants in BEST. Supermarkets and mini-markets accounted for the largest percentage of projects, due to one of the major contractors targeting mini-markets. Table 3.4 presents a breakdown of percentage of projects by business type.

Table 3.4 Projects Allocated by Type of Facility

Facility Type	# of Projects	% of Projects	Savings Peak kW	kWh	Incentive
Supermarket, mini-market	165	48.5%	333.6	3,089,498	\$549,370
Other	62	18.2%	402.4	1,251,706	\$236,001
Office, medium	40	11.8%	475.6	1,232,023	\$294,340
Retail, small	36	10.6%	91.3	844,781	\$158,618
Office, small	8	2.4%	70.6	168,151	\$44,635
Office, high rise	7	2.1%	97.7	248,982	\$60,405
Office / warehouse	6	1.8%	61.9	174,674	\$38,784
Bank	4	1.2%	58.6	194,472	\$37,636
Retail, large	4	1.2%	33.7	115,525	\$22,657
Restaurant	3	0.9%	10.9	46,218	\$4,061
Warehouse	3	0.9%	12.2	48,551	\$7,926
Hospital	2	0.6%	14.9	66,524	\$9,672
TOTAL	340	100.0%	1,663	7,481,104	\$1,464,106

Eligibility criteria did not require participants to be “hard-to-reach (HTR)” small businesses, as defined by the CPUC, to be eligible for the program. However, 91% of the projects (309 out of 340) involved small businesses that met at least one of the HTR criteria of: less than 10 employees, a leased facility, or using non-English as the primary business language. A number of participants who qualified as hard-to-reach small businesses did so only because they leased their facilities. Also, some participants had peak demands below 100 kW only because their total demand for energy was distributed among several accounts.

3.5 TARGET ENERGY EFFICIENCY MEASURES

Both gas and electric measures were eligible for the program. Standard prices per measure unit were established for inventories of typical electric measures, and incentive rates were established for both gas (\$ per Therm) and electric demand (\$ per kW) savings. The program design also provided contractors the ability to submit proposals that included custom measures not listed in the program measure inventories.

Targeted eligible energy efficiency measures of the program included:

- T-8 fluorescent lamps
- Compact fluorescent lamps (CFLs)
- Lighting controls
- HVAC/economizer controls
- Window film
- Programmable thermostats
- Customized electric measures
- Customized gas measures.

The program implementation plan (PIP) projected that annual energy savings associated with lighting measures would represent around 80% of the total savings affected by the program. Energy savings associated with lighting measures actually represented only 45% of the claimed gross annual savings of the program. There were no custom gas measures installed in the program. Custom electric measures installed in the program included refrigeration measures (e.g., door heater controls).

Table 3.5 provides a breakdown of the claimed gross annual energy savings of the installed measures of the projects in the program.

Table 3.5 Claimed Gross Demand and Annual Energy Savings by Measure

Measure Type	# of Projects w/ Measure ¹	Gross Demand (kW) Savings		Gross Annual Electric (kWh) Savings	
		Total	% of Total	Total	% of Total
Lighting	510	1,129	69.1%	3,286,276	45.0%
Evaporator Fan Retrofit	121	107	6.5%	986,844	13.5%
Door Heater Controls	107	82	5.0%	1,854,708	25.4%
Custom	99	276	16.9%	1,137,380	15.6%
HVAC	2	10	0.6%	3,843	0.1%
Window Film	1	31	1.9%	23,250	0.3%
Total		1,663	100%	7,481,104	100%

(1) Projects add up to more than the 340 completed projects due to some projects having more than one measure.

3.6 PROGRAM SERVICE OFFERINGS

The program offering included a “one stop shop” service involving:

- Education through program literature and website
- Site audit
- Feasibility analysis
- Project proposal
- Equipment procurement and installation

- Rebates to offset project costs
- Contractor equipment and labor warranties
- Program implementer (KEMA-Xenergy) review of contractor work
- SDREO sponsorship of program

A significant majority of customer participants found the range of program service offerings “valuable.” As shown in Table 3.6, each of the program offerings was found to be valuable by at least 89% of all the participants responding to the telephone survey.

The most valuable offering identified by the telephone survey participants was “equipment procurement and installation,” which was found to be valuable by 99% of the participants. A large increase was seen in respondent perceptions of equipment procurement and installation since the previous survey. The 2003-2004 program evaluation survey found that one-third of participants who responded to the survey listed equipment procurement and installation as “not valuable,” compared to 99% of the current survey participants finding it to be valuable. A possible explanation in the past may have been some dissatisfaction with the perceived quality and performance (e.g., different or insufficient lighting, inability to detect energy cost savings) of the installed measures. It may be that participants now perceive a higher level of quality and/or performance than in the past.

Table 3.6 Customer-Reported Value of BEST Program Elements

BEST Program Elements	Valuable	Not Valuable
BEST educational information	94%	6%
Other energy efficiency information	92%	8%
Site audits	89%	11%
Project proposal benefits explanation	96%	4%
Equipment procurement & installation	99%	1%
Rebates	94%	6%
KEMA-Xenergy review of contractor work	93%	7%
SDREO sponsorship	92%	8%

3.7 INCENTIVE PRICING, STANDARD MEASURE PRICING, AND REBATE CAPS

The program design included a rebate-style financial incentive that was based on the installed measure. Most measures had incentive payments based on kW reduced (of connected load), with total incentive payments paid per project capped at the total project costs. Incentive amounts varied by measure from \$215/kW (for compact fluorescent lamps) to \$650/kW (for most other lighting efficiency measures). Custom measures were eligible for rebates of \$0.20/kWh and \$1.00/Therm).

To protect against inflated project costs, the program design included specifying standard measure costs per unit (equipment plus labor) based on a survey of contractor costs. Project proposals were assured of immediate approval and a more streamlined review process if the proposals used the standard measure costs of the program and the kW reductions specified in the measure tables.

The original program design proposed that incentive payments would total up to 80 percent of project costs; however, 143 of the 340 projects (42%) had incentive payments greater than 80 percent of the project costs. And 27 projects (8%) received incentive payments that equaled 100% of the project costs. For the 2004-2005 BEST program, total incentive payments represented an average of 71 percent of total project costs for the 340 completed projects of the program. This is down from 91 percent of total project costs for the 2002-2003 BEST program.

Standard measure costs (including hardware and installation) were set based on a survey of contractors. By design, proposals that were submitted by program contractors using standard measure costs were automatically approved (once the customer was verified as eligible to participate in the program) to advance to the next stage in the process. “Custom proposals” required more analysis from the program implementer and were subject to longer processing times.

Interviews with contractors reveal a common perception that incentives were not high enough for the 2004-2005 BEST program. Contractors generally thought the rebates were “okay,” but should have been higher to promote greater participation in the program. Several contractors noted that the lower rebates, coupled with small projects and a lot of paperwork, made it barely worth their while to participate. In fact, one interviewed contractor pulled out of the program early for exactly these reasons. A different contractor stated that for small businesses, such as the target of the BEST program, rebates should be more in the range of 90 – 100%.

3.8 PROGRAM PROMOTION STRATEGY AND PARTNERSHIPS

SDREO administered the BEST program within a San Diego Regional Energy Partnership (SDREP) that included the City and County of San Diego, City of Carlsbad, City of Chula Vista, City of Escondido, and the City of Oceanside. Through this arrangement, interested partners could participate in the BEST program. The use of the SDREP had limited success, though, as no type of reimbursement was available to convince them to help promote the program.

The program delivery strategy evolved to only contractors developing projects, generating proposals, installing measures, and completing projects. The participant survey reveals that 38% of the respondents learned of the program through a program contractor or vendor. The next largest proportion, 35%, heard about the program through SDREO. Another 17% of participants learned of the program from a friend or business contact. The participation in the program of many of the liquor store businesses was facilitated through word-of-mouth within a network of small liquor stores in San Diego. Table 3.7 provides details of how participants first learned about the BEST program, based on the telephone interviews.

Table 3.7 Method by which Participants First Learned of BEST Program

Friend / Business Contact	17%
Community Organization / Industry Association	4%
Communication from SDREO, Program Administrator	35%
Communication from KEMA-Xenergy, Program Implementer	3%
Contractors and/or Vendors	38%
Other	4%

The program implementer recruited and trained contractors, developed and maintained the project website and database (with which contractors input the results of site audits, generated project proposals, etc.), reviewed project proposals for accuracy, conduct pre-installation and post-installation inspections, facilitated resolution of issues, and recommended incentive payment on completed projects. The program administrator established contracts, oversaw the progress on the project, ensured the program adhered to the approved program implementation plan and budget, engaged the EM&V consultant, periodically reported on program progress to the CPUC, and issued incentive payments to contractors.

Appendix C includes an Implementation Work Flow Diagram depicting the steps involved in a project from project initiation to project completion.

3.9 COORDINATION ACTIVITIES

SDREO worked closely with SDG&E to prevent double-dipping, in which energy efficiency projects would apply for incentives from multiple programs. There were two programs with potential for double-dipping: Express Efficiency and Energy Smart Grocer (ESG) programs. Prior to the approval of any project rebate, SDG&E and the ESG program administrator reviewed the BEST program participant list to eliminate the possibility of double-dipping in either of these other two programs. The primary coordination activities were with the ESG program, which was a third-party program. One specific measure, anti-sweat heater controls, overlapped both programs. BEST program staff met with the ESG program administrator to discuss coordination issues. It was agreed that both programs would exchange selected customer participant lists to avoid overlap of customers. As the ESG contractor installed anti-sweat heater controls on only medium-temperature refrigerator doors, it was decided that BEST projects would only address low-temperature units in stores where the medium-temperature doors had already been retrofit.

3.10 PROGRAM BUDGET

The budget for the BEST program was fixed at \$2,336,449, with incentive funds representing \$1,580,481. The final BEST Budget Worksheet indicates that actual program expenditures will be \$2,015,739, with incentives representing \$1,464,078. The above projected levels of effort were the basis of the approved program budget and did not change throughout the course of the program. The 2004-2005 BEST program committed 93% of the available incentive funds, while achieving 71% of the gross annual energy savings goal.

3.11 PROGRAM SAVINGS GOALS

The BEST Program Implementation Plan states that the program will realize 100% installation of measures that form the basis of claimed gross annual energy savings. In addition, the PIP assumes that 4% of the program participants would be “free-riders,” participants who would have undertaken the project without the incentives and assistance of the BEST program. This level of free-ridership corresponds to a 0.96 net-to-gross ratio, the same ratio assumed in the Express Efficiency program.

The target gross and net demand and annual energy savings goals were as follows:

- Gross annual electrical energy savings: 10,580,000 kWh
- Net annual electrical energy savings: 10,158,643 kWh

- Net peak demand savings: 5,375 kW
- Gross annual natural gas savings: 32,322 Therms
- Net annual natural gas savings: 31,029 Therms

The results of the telephone survey of participants suggest that as many as 17% of the participants describe their likely actions as consistent with those of free-riders or partial free-riders. This corresponds to a net-to-gross ratio of 0.830. Subsequent sections of this report address the analysis of gross savings and of net savings of the program.

3.12 PROGRAM COST-EFFECTIVENESS

The Program Implementation Plan projected program cost-effectiveness calculations for the Total Resource Cost (TRC) test ratio of 1.34 and a Participant Cost test ratio of 5.11.

Section 8 presents a discussion of the cost-effectiveness analysis.

Program implementation was examined largely through telephone and in person interviews with contractors, the program implementer, and the program administrator. The implementation process of the BEST program followed the original program design, with a few exceptions:

- The change in name from DISC to BEST,
- The exclusion of “A Rate” customers,
- The peak demand of participants falling between 20-100 kW instead of less than 100 kW,
- The waiving of the requirement that participants be located in economically distressed areas,
- The curtailment of outreach and marketing to CBOs, and
- The curtailment of program implementer project development activities.

While it was projected that lighting would represent almost 80% of the energy savings in the 2004-2005 BEST program, only 45% of the claimed energy savings actually came from lighting projects. Projects in the form of evaporator fan retrofits and door heater controls in refrigerated display cases represented an additional 39% of the claimed energy savings. The level of success with these measures was somewhat unexpected, and is due mainly to a single contractor that was particularly aggressive in marketing these energy efficiency measures. There were no gas measures installed in the program.

As in the 2002-2003 BEST program, there were very few comprehensive energy efficiency projects. Projects often contained multiple lighting measures, or multiple refrigeration measures, but projects rarely contained combinations of end-uses such as both lighting and refrigeration. Several possible reasons for these outcomes include:

- There are fewer multi-end use opportunities within small commercial facilities,
- Most contractors specialize in measures that address single end-uses (e.g., lighting contractors),
- Projects may not be big enough to put together teams of diverse companies to address multiple end uses,
- It is not cost-effective, and the incentive pricing doesn't reward, seeking additional savings beyond the “big hits” and a company's expertise, and
- Program design and implementation are really focused on standard lighting measures.

4.1 CONTRACTOR OBSERVATIONS

Interviews with contractors reveal an overall positive view of the BEST program. Contractors thought the program design was good. However, the largest complaint by contractors was that the required paperwork was onerous. Four of the five contractors interviewed identified the level of paperwork as being the least effective component of the program. Two noted that the

paperwork requirements were streamlined as the program progressed, and all stated that the program implementer was extremely helpful in understanding the paperwork requirements. Some of the comments regarding the paperwork were:

- “Cumbersome and time-consuming”
- “Crazy—much more than we’re accustomed to, and we’ve done a lot of utility programs.”

Contractors stated they had little to no interaction with SDREO, but thought that SDREO’s performance was mostly okay to good. All contractors gave the program implementer very high marks for responsiveness and support provided to the contractors. Comments regarding the program implementer and SDREO included:

- “The administration and implementation were very good compared to other programs”
- “[The program implementer was] extremely helpful. I’m very satisfied.”
- “Les Owashi (KEMA’s project manager) did all he could to help. If Les were involved in another program, I would definitely be interested in participating.”
- “We had a great working relationship with Les Owashi. Les and Dave (Dave Gordon, SDREO’s program manager) were great to work with.”

Contractors made the following recommendations for improvements to the program design and implementation:

- Provide assistance in identifying potential eligible customers. The eligibility requirements of using more than 20 kW but less than 100 kW made it extremely difficult to identify eligible customers.
- Reduce and streamline the paperwork requirements. The paperwork was excessive, even by utility DSM program standards.
- Make the data entry process more expeditious. Getting data into the systems was tedious and time-consuming.
- Improve turnaround time. Customers were unhappy to wait several months to get measures installed.
- Increase incentive amounts. The relatively small sizes of the projects and the relatively small incentives made it difficult for the contractors to justify the work involved in identifying eligible customers and completing the necessary paperwork.
- Make customer co-pays consistent, or remove them altogether. Customers were confused why some measures had co-pays and others didn’t. Customers did not like the co-pays.
- The payment process took too long at the beginning of the program, but improved over time.

4.2 SDREO AND PROGRAM IMPLEMENTER OBSERVATIONS

SDREO and the program implementer provided the following comments about the program design and implementation:

- The turn-key approach to the design worked well.
- The use of contractors to disseminate information and market the program worked well.
- The use of a program implementer worked well, and provided continuity.
- The current design allows the local government competitive bid process to be bypassed, which expedites the process.
- Using pre-approved contractors with standard pricing worked very well. This model is recommended for future programs.
- The use of a 20 kW minimum demand eligibility criteria created problems for everyone.
- A better process to cross-reference participants with other programs to check for double-dipping is needed. Cross-checking should be done in real-time, and the process should be centralized.
- The payment reimbursement process was originally too slow and cumbersome. Having the program implementer pay the contractor immediately after installation works best for everyone.
- There were some negative impacts resulting from reducing the rebate from about 90% of the project cost (in the 2002-2003 program) to about 70% of the project cost.
- SDREO believes that they should have greater control over marketing. They believe that having the program implementer responsible for all marketing activities (and the marketing budget) is not the best approach.
- SDREO notes that a major challenge was the shortened implementation timeline due to delays in contract signing. The IOU/Implementer contract was not signed until May 26, 2004. The program launch date ended up being over six months behind schedule, officially beginning on July 23, 2004.

Although many more projects were completed in the 2004-2005 program, the projects were generally smaller. The smaller typical size of projects has made it more difficult to meet the program energy goals. In addition, the program competes with Express Efficiency in the 20 – 100 kW range. And there are few contractors in the San Diego area to market the program.

4.3 PROGRAM DESIGN AND IMPLEMENTATION RECOMMENDATIONS

Several observations can be made regarding the BEST program design. Overall, the program design was a success. The roles of SDREO, the program implementer, and the contractors were well-defined, and generally worked well for the program.

For a future program, the minimum demand eligibility criteria (20 kW) should be rescinded. It would be very helpful for the contractors if customer identification could be improved.

Negotiations with the utility should include a requirement that they provide a list of eligible customers. Signing a confidentiality agreement with the utility (even having each contractor sign a separate agreement) should alleviate any customer confidentiality concerns. The program design should also work to streamline the application forms, to reduce the paperwork requirements of the contractors.

Although the contractors commented that the incentive levels were too low, the fact is that 340 projects were successfully completed with the lower rebates. Although larger rebates may have brought some additional projects into the program, it cannot be concluded that the lower rebates were a barrier to the program's success. A program design that requires less time from contractors in identifying eligible customers and in completing application forms will reduce the "hassle factor," and will result in the contractors having a greater level of satisfaction in the BEST program. Reducing the contractors' "hassle factor," rather than increasing the incentive levels, would more likely result in increasing the participation rate in the program.

It appears that the BEST program is reaching saturation of eligible customers. It was estimated by the program implementer that there are 4,000 to 8,000 eligible accounts. These are customers who fall between 20 kW and 100 kW demand, and who are not on SDG&E's "A Rate" schedule. Including the current implementation period's approximately 350 customer, the BEST program has brought in about 450 local customers since its inception in 2002. With an approximate 10 to 1 fail to success rate to enroll customers (an industry approximation), it would appear that most eligible customers must have been approached about the BEST program. It is safe to say that the BEST program has been successful at reaching their target market, and continuation of the program may result in diminishing returns as the saturation rate nears 100 percent. The BEST program has been a success, but continuation of the program in its current form is not recommended.

Impact evaluation activities focused on assessing market effects, gross savings, and net savings that resulted from the program. The review of market effects includes the impact on contractors in the energy savings service sector and participants in the small business sector in the SDG&E service territory. Market effects were largely assessed based on the results of telephone interviews with contractors and customer participants.

5.1 CONTRACTORS

The BEST program resulted in limited to no longer-term market effects on contractors. There were a limited number of contractors in the program. Of the contractors that participated in BEST, three dominated the participation in the program and represented, in aggregate, 89% of all program energy savings, with 316 of the 340 BEST projects (93%). The top contractor represented 48% of the program energy savings, with 177 of the 340 BEST projects (52%).

During telephone interviews with five contractors representing 326 of 340 projects submitted to the program (and representing in aggregate 95% of the program energy savings), all five contractors reported that their pursuit of energy savings projects was not new to their companies. Four of the five contractors defined themselves as lighting contractors specializing in energy services and/or savings, and one contractor defined herself as specializing in refrigeration energy conservation. The contractors surveyed appeared to each focus on a limited number of energy efficiency technologies, and most did not attempt projects outside of their existing expertise. Site inspections of a sample of projects and review of data on all projects in the program supports the conclusion that almost all project proposals were not comprehensive and were focused on single end uses and related measures.

5.2 PARTICIPANTS

Two sets of participant telephone interviews were conducted, one in March 2005 and the other in July 2006. The 2005 interview reached 37 participants, and the 2006 interview reached 57 participants, for a total of 94 participants. Given the total population of 340 participants, the 94 participants surveyed exceeds the 90% confidence / 10% precision statistical accuracy goal described in the Approved EM&V Plan given in the Appendix. Results from the two surveys have been combined for presentation purposes.

The BEST program resulted in short-term market effects on participants, successfully motivating participants to complete 340 projects. Of the participants who completed the telephone survey, two-thirds (67%) reported that they had not previously pursued energy efficiency projects. There was diverse (in terms of types of facilities/businesses) participation of small businesses among the completed projects. Some of the participants did pursue multiple projects.

Very limited longer-term market effects on the small business community may result from the BEST program. From the participant telephone survey, 71% reported that they may pursue additional energy efficiency improvements after their participation in the BEST program. However, the BEST program participants represent a very small fraction of the total population of tens of thousands of small businesses. There is no evidence that the BEST program changed

the overall small business sector such that members of the sector will pursue energy efficiency projects in the absence of the BEST program.

Table 5.1 Participant-Reported Past and Future Energy Efficiency Improvements

Past and Future Energy Efficiency Projects	Yes	No
Participant Undertook Energy Efficiency Improvements Prior to BEST Program	33%	67%
Participant Contemplating Future Energy Efficiency Improvements	71%	29%

The analysis of the gross savings of the BEST program consists of four steps:

- Aggregate recorded project data in the BEST program activity-tracking database to calculate claimed gross demand savings and claimed gross annual energy savings,
- Analyze and adjust, if needed, the claimed gross kW reduction based on the results of site inspections and the review of project data for a sample of sites,
- Analyze and adjust, if needed, the stipulated annual operating hours used in determining the claimed gross annual kWh savings based on the review of project data for a sample of sites, and
- Extrapolate any adjustments to kW reduction from the sample of projects to the results of the program and calculate adjusted gross demand and annual energy savings.

The analysis and assessment of gross and net savings were based on a review of data in the project activity-tracking database, site inspections and data collection, and the telephone survey of customer participants.

6.1 CLAIMED GROSS SAVINGS

Claimed gross savings, project costs, incentives, and other information were aggregated using data for the 340 completed projects listed in the BEST program activity-tracking database. Additional, various performance ratios (e.g., average project payback, average incentive per annual kWh) were calculated using the aggregate data. The results are presented below in Tables 6.1 and 6.2.

Table 6.1 BEST Program Claimed Gross Savings

# of Completed Projects	Claimed Gross Demand (kW) Savings		Claimed Gross Annual Electricity (kWh) Savings		Claimed Gross Annual Natural Gas (therms) Savings	
	Total	Avg/Project	Total	Avg/Project	Total	Avg/Project
340	1,663	4.89	7,481,104	22,003	0	0.0

Table 6.2 BEST Program Cost Savings, Project Costs, Incentives, and Payback

Cost Savings (\$)		Project Costs (\$)		Incentives (\$)		Avg Project Payback (Yrs)	Avg Incentive Per Annual Electricity Savings (\$/kWh)	Avg Incentive Per Project Costs (%)
Total	Avg/Project	Total	Avg/Project	Total	Avg/Project			
\$974,383	\$2,866	\$2,068,866	\$6,085	\$1,464,106	\$4,306	2.12	\$0.20	71%

6.2 BASELINE EQUIPMENT ASSUMPTIONS

The BEST contractors were very aggressive at completing project installations quickly. The fast installation turnarounds, combined with a delay in receiving updates to the BEST database, made it very difficult to perform pre-installation inspections as part of the EM&V work. As a result, to review the accuracy of baseline assumptions, the baseline information of existing equipment specified in the BEST program activity-tracking database was carefully scrutinized. Notes taken by program implementation staff during pre-installation inspections were reviewed for accuracy as part of the EM&V effort. In addition, information was gathered during post-installation site inspections of a sample of projects regarding the vintage of the baseline equipment that had been in place at project sites. No discrepancies with baseline equipment vintage were observed in reviewing the project files.

6.3 SITE INSPECTIONS

The program implementer conducted pre- and post-installation inspections of all projects to verify baseline information and the installation of project measures as specified in project documents (e.g., existing equipment inventories, proposals, work orders, project completion reports). EM&V activities included site inspections on a sample of the completed projects to verify the accuracy of information used in the calculation of energy savings and incentive payments. For a sample of 11 projects, installed equipment was visually confirmed and compared to specified replacement equipment documented in project proposals and requests for incentive payment. The sample of 11 sites represents an 80% confidence level with a 20% level of precision, assuming a large defined population and a coefficient of variation of 0.5.

The site inspections had the following objectives:

- Verify installed equipment counts, types and capacities,
- Verify facilities were currently operating,
- Assess the appropriateness of the stipulated hours of operation,
- Assess comprehensiveness of project proposals,
- Assess the appropriateness/quality of the installed measures,

The 11 site inspections were selected at random from the population of 340 projects. The sites visited included lighting measures (T8 fluorescents, compact fluorescents, LED *Exit* signs) and refrigeration measures (evaporator fan replacement, door heater controls). More than 11 measures were observed during the inspections, as each project site contained multiple measures.

The site inspections found high levels of accuracy, although a few discrepancies were noted. During the site inspections, the number of installed measures/equipment (T8 lamps, etc.) that were observed and counted exactly matched the number of measures/equipment specified in program documents (e.g., program activity tracking database, requests for incentive payment). However, in two instances, measure equipment types did not exactly match. In one case, program documents indicate that compact fluorescents were installed in a restroom and two lobbies; however, standard incandescent bulbs were present during the inspection. It is impossible to know if the compact fluorescents were installed and then removed, or never installed in the first place. It has been observed in other demand-side management programs that

screw-in compact fluorescents are often stolen, and then maintenance personnel replace them with less-expensive, standard incandescent bulbs.

The other project with an inconsistency involved a major T12 to T8 lighting retrofit. Equipment counts for the store were correct. The complete store was retrofitted with the exception of two exterior fixtures. The store owner noted that the contractor was aware that the two fixtures had not been replaced, and had indicated that he would return to replace the remaining two fixtures. The store owner also mentioned that he would be withholding payment to the contractor until the work was completed. Nexant does not believe that these two instances are indicative of a program-wide reporting bias; thus, no corrections are necessary to correct for the counts or types of measures/equipment installed in the program.

In addition, the analysis of the sample projects included a review of documents and claimed energy savings. Project files were organized in numerical order within plastic file containers. Each folder had a checklist sheet and project notes that included times and dates of specific actions on the project. Pre-installation and post-installation inspection forms were included in each folder, and all reviewed inspection forms were signed by a KEMA inspector. During one project review, it was observed that the KEMA inspector found an incorrect equipment count during the pre-installation inspection. The folder included a copy of an e-mail from the contractor acknowledging the accurate count. The post-installation inspection form and the project completion form both included the corrected counts.

6.4 EQUIPMENT OPERATING HOURS

The BEST program design included the use of stipulated operating hours in the calculation of energy savings that would result from the installation of proposed energy efficiency measures. Contractors were instructed to input the business hours of a facility as a proxy or estimate of the operating hours of the existing and replacement equipment. Contractors were further instructed to query facility personnel to verify the appropriateness of using business hours to stipulate the operating hours of equipment. In some cases, especially involving exterior lights and continuously operating lighting equipment, such as *Exit* signs and stairwell lighting, hours of operation other than business hours were used to estimate the operating hours of specific equipment.

The 11 site inspections performed as part of the EM&V process included a check of the appropriateness of the stipulated hours of operation. For each of the 11 sites, Nexant's inspector noted that the hours of operation used in the project savings calculations were reasonable or conservative (meaning that less savings were claimed than what would be actually realized). As the stipulated hours of operation used for project savings appear to be reasonable or conservative, no changes to the operating hours are suggested.

Of the customer participants who responded to the telephone survey, 58 percent estimated that their energy efficiency measures operated the same as their business hours, and 32 percent stated that their energy efficiency measures operated more hours than their business hours. Only 10 percent thought that the measures operated less hours than the business hours.

6.5 ADJUSTMENTS TO GROSS SAVINGS

The site visits performed as part of the EM&V activities revealed no consistent problems with installed equipment types, counts, or operating hours. Thus no adjustments to the claimed gross energy savings or demand savings are necessary. The aggregate claimed gross demand savings and claimed gross annual energy savings recorded in the BEST program activity-tracking database are accepted without revision.

The analysis and assessment of gross and net savings were based on a review of data in the project activity-tracking database, site inspections and data collection, and the telephone survey of customer participants. The calculation of net savings involves estimating the “free-ridership” in the program and then calculating a net-to-gross ratio used to eliminate the savings claims associated with “free-riders.” “Free-riders” are participants who would have undertaken some portion or all of their projects within a near-term timeframe without the incentives and assistance provided by the program. The Program Implementation Plan (PIP) assumed that 4% of participants would be “free-riders” (a net-to-gross ratio of 0.96, the same ratio assumed for the Express Efficiency program).

7.1 ESTIMATION OF “FREE-RIDERSHIP” AND NET-TO-GROSS RATIO

The methodology of assessing free-ridership was changed from the first participant survey to the second. The earlier participant survey asked whether the respondents were “Very likely,” “Somewhat likely,” “Not likely,” or “Would not install” the measures of their completed project in the next two years if the BEST program was not available. Responses from 34 participants were obtained. There was concern that participants of the original survey were “fishing for the right answer”, which would contribute to error in the free-ridership calculation. There was additional concern that the participants did not understand that the measures installed at their facilities were subsidized through ratepayer funds. In the follow-up survey performed in 2006, the 57 respondents were asked a more detailed question, as follows:

“A large part of the cost of this project was covered by California ratepayer funds. A typical project like the one completed at your site would usually cost about five times what you paid to have it completed through the BEST program. If you had to pay the entire cost yourself, do you think you would have completed this project on your own within the next two years?”

For the second survey, “yes” responses were assigned “very likely to install,” while “no” responses were assigned “not likely to install / definitely not.” The results of the second survey were then combined with the results of the first survey. Table 7.1 presents the percentage distribution of the answers of participants to the question on free-ridership.

Table 7.1 Participant-Reported Likelihood of Installing Measures without BEST

Likelihood of Installing Measures without BEST	Response
Very Likely	13.2%
Somewhat Likely	7.7%
Not Likely / Definitely Not	79.1%

Based on the results of the telephone survey, the level of free-ridership as a percentage of all participants in the program is calculated by adding the percentage of the respondents who answered “Very Likely” (13.2%) to one-half the percentage of respondents who answered “Somewhat Likely” ($0.5 \times 7.7\% = 3.8\%$). The participant survey thus indicates that 17% of the

BEST participants may be classified as free-riders. This translates into a net-to-gross ratio of 0.830, which has been applied to all net savings calculations in this report.

It is possible that this methodology may be overestimating the level of free-ridership, due to self-reporting bias of the telephone survey participants, particularly in the first telephone survey. The program participants consisted almost entirely of small businesses, of which most (67%) had not previously implemented even the simplest of energy efficient lighting measures. Considering the barriers reported by the same population, it appears unlikely that they would have installed the measures on their own in the absence of the BEST program. It is more likely that the results indicate the participants viewed energy efficiency in a positive light. It is also interesting to note that the results of the two telephone surveys are quite different, with the first telephone survey giving a 25% level of free-ridership, while the second survey reveals a 12% level of free-ridership on a larger population of respondents.

7.2 ADJUSTMENTS TO NET SAVINGS

Applying a net-to-gross ratio of 0.830 to the BEST program gross savings results in the adjusted net savings of the program. Table 7.2 gives the resulting net program savings. Gross program-projected energy savings and net program-achieved energy savings are presented for each year of expected equipment operation in Table 7.3. This information is also provided in the CPUC Impact Table in Appendix E.

Table 7.2 BEST Program Net Savings

# of Completed Projects	Demand (kW) Savings		Annual Electric Energy (kWh) Savings		Annual Natural Gas (Therms) Savings	
	Gross	Net	Gross	Net	Gross	Net
340	1,663	1,380	7,481,104	6,209,316	0	0

Table 7.3 BEST Program Energy Impacts

Year	Calendar Year	Ex-ante Gross Program-Projected Program MWh Savings	Ex-Post Net Evaluation Confirmed Program MWh Savings	Ex-Ante Gross Program-Projected Peak Program MW Savings	Ex-Post Evaluation Confirmed Peak MW Savings	Ex-Ante Gross Program-Projected Program Therm Savings	Ex-Post Net Evaluation Confirmed Program Therm Savings
1	2004	0	0	N/A	0	0	0
2	2005	10,582	980	N/A	0.307	32,322	0
3	2006	10,582	4,614	N/A	1.012	32,322	0
4	2007	10,582	6,065	N/A	1.357	32,322	0
5	2008	9,228	5,973	N/A	1.307	32,322	0
6	2009	9,228	5,867	N/A	1.274	32,322	0
7	2010	8,832	5,822	N/A	1.260	32,322	0
8	2011	8,832	5,822	N/A	1.260	32,322	0
9	2012	8,832	5,822	N/A	1.260	32,322	0
10	2013	8,240	5,822	N/A	1.260	32,322	0
11	2014	8,240	5,822	N/A	1.260	32,322	0
12	2015	8,239	5,822	N/A	1.260	32,322	0
13	2016	8,179	5,803	N/A	1.235	15,833	0
14	2017	7,390	5,524	N/A	1.215	15,833	0
15	2018	7,390	3,712	N/A	1.092	15,833	0
16	2019	7,390	3,428	N/A	1.070	15,833	0
17	2020	7,265	3,428	N/A	1.070	15,833	0
18	2021	0	2,818	N/A	0.830	0	0
19	2022	0	1,107	N/A	0.302	0	0
20	2023	0	0	N/A	0	0	0
TOTAL	2004-2023	139,028	84,254			434,702	0

The BEST program was completed within the original projected program budget. The program remained cost-effective based on an estimated Total Resource Cost (TRC) Test ratio of 1.34 and a Participant Cost Test ratio of 5.11. These values indicate the 2004-2005 BEST program was successful from both a utility resource perspective and from a participant perspective. The cost-effectiveness values, however, are lower than the levels projected in the Program Implementation Plan (2.17 and 8.39, respectively).

8.1 ANALYSIS OF BUDGET/ACTUAL EXPENSES

The budget for the BEST program was fixed at \$2,336,449, with incentive funds representing \$1,580,481. The final BEST Budget Worksheet indicates that actual program expenditures will be \$2,015,739, with incentives representing \$1,464,078. The remainder of the budget that is unspent and uncommitted is \$341,968. Administrative costs represent half (\$173,856) of the unspent budget, and direct implementation represents another large component (\$130,745).

8.2 TOTAL RESOURCE COST (TRC) AND PARTICIPANT COST TESTS

The calculations of the Total Resource Cost (TRC) and Participant Cost Tests included in the Final BEST Budget Worksheet were reviewed and adjusted to estimate the cost-effectiveness of the program. The calculations were adjusted to include the net-to-gross ratio to 0.830.

Table 8.1 TRC and Participant Cost Test Inputs and Results

Test	Costs	Benefits	Ratio
TRC	\$2,610,201	\$3,499,140	1.34
Participant Cost	\$2,480,168	\$12,678,826	5.11

EM&V Plan: Business Energy Services Team (BEST) Program No. 1285-04**Introduction**

The San Diego Business Energy Services Team (BEST) Program, No. 1285-04 is a small commercial rebate program sponsored by the San Diego Regional Energy Partnership (SDREP) and administered by the San Diego Regional Energy Office (SDREO). The program implementer is KEMA, Inc.

Meeting CPUC EM&V Objectives

The following is a summary of the how the EM&V plan will meet CPUC objectives, to the extent possible within the available budget:

- 1) Measuring level of energy and peak demand savings achieved: As discussed in detail below (Baseline Information, Energy Efficiency Measure Information, Measurement and Verification Approach, and Evaluation Approach sections), EM&V activities include reviewing program activity-tracking project and savings data, conducting pre-installation and post-installation site inspections of a sample of projects, including visual confirmation of project data and spot kW measurements, and survey of participants, including additional confirmation of project data, such as the operating hours of project measures, and assessment of program assumptions that affect energy savings calculations.
- 2) Measuring cost-effectiveness: As discussed in detail below (Cost-effectiveness Analysis subsection of Measurement and Verification Approach section), EM&V activities include the review of and recommendation of adjustments to the TRC and PC cost-effectiveness test calculations as presented in the most current program budget workbook at the time of the drafting of the EM&V final report.
- 3) Providing up-front market assessments and baseline analysis: As discussed in detail below (Baseline Information section, Gross Savings subsection of Measurement and Verification Approach section), EM&V activities will include a review of program activity-tracking baseline data collected and entered project by project during the program implementation by program contractors and verified and adjusted by the program implementer, and the review of program assumptions affecting baseline and energy savings calculations, including a literature search of relevant market studies and EM&V reports (including the 2002-2003 BEST Program EM&V final report written by Nexant, Inc).
- 4) Providing Ongoing Feedback and Corrective, Constructive Guidance Regarding Implementation of Programs: As discussed in detail below (Energy Efficiency Measure Information and Reporting Schedule subsection of Evaluation Approach), EM&V activities will include a quarterly review and analysis of program activity tracking data to assess the level and type of participation in the program, monthly EM&V reports on activities, and an annual EM&V progress report with preliminary findings. During the development of the program logic chart (as described in objective #5 below and in the Evaluation Approach section), EM&V activities

will include feedback and constructive guidance to the program administrator on clarifying program objectives and performance tracking.

5) Measuring Indicators of the Effectiveness of Specific Programs, Including Testing of Assumptions that Underlie the Program Theory and Approach: As discussed in detail below (Evaluation Approach section), EM&V activities will include the development of a “program logic chart” to document the program theory and approach, and to specify the effectiveness and performance metrics and activities to measure performance metrics. As described in detail below, such EM&V activities include review of reported program activity (database, monthly progress reports) to assess the appropriateness of the level and type of program activities and participation, survey of participants to assess, among other aspects of the program, the validity of stated market barriers to energy efficiency and participant value of program elements and offerings, and interviews with program contractors, administration staff, and implementation staff to assess the effectiveness of program implementation as planned or if different from plan.

6) Assessing the Overall Level of Performance and Success of Programs: As discussed in detail below (Evaluation Approach), the result of all the EM&V activities in the plan will be brought together in the EM&V final report to inform the assessment of overall level of performance and success. The assessment of overall performance and success of the program will be based on whether or not the program: was implemented as planned (or changed to address needs), completed program activities and outputs (e.g., contractor workshops, collaboration with members of partnership, generated project proposals, conducted site inspections, completed installations), achieved the desired level and type of participation, achieved the target energy savings, and remained cost-effective.

7) Informing Decisions Regarding Compensation and Final Payments: EM&V activities will include the review of calculations of a sample of individual project incentive payments and the review of total program savings. EM&V activities involving the review of program assumptions, design of formulas for energy savings and incentive calculations, and the review and analysis of information in the program activity tracking database will provide the program administrator with cross-check information when responding to a request for incentive payment from the program implementer on a project by project basis. EM&V review of total program savings will provide the CPUC with information that can be included in the determination of administrator/implementer performance compensation

8) Helping to Assess Whether There is a Continuing Need for the Program: As described in objective #6 above, the EM&V final report will include an assessment of the overall level of performance and success of the program. In addition, the final report will recommend improvements to the program, if any, to enhance future program performance and success, if possible. Recommendations will include an assessment of a continuing need for the program based on: consideration of the value placed on the program and its elements by participants, the level and type of participation, if there was excess demand for participation in the program, and, if there was insufficient demand for participation in the program, whether adjustments to the program would potentially enhance the level and type of participation.

The program will conduct the following EM&V activities:

- 1) Conduct of process evaluation based on the development of a program logic chart through:
 - Review of program documents (e.g., PIP, budget workbook, website, training material, marketing material, participation forms) (by Nexant)
 - In-person interviews with program administrator (SDREO) and implementer (KEMA) staffs (by Nexant)
 - Telephone interviews with representatives of contractors (by Nexant)
 - Telephone interviews with representatives of SDREP members (by Nexant) and
 - Telephone survey of a sample of participants – up to 68 completions in each 4th QTR of 2004 and 2005 (by SDSU SSRL)
- 2) Conduct of impact evaluation through:
 - Collection and documentation of baseline equipment and operations, and energy efficiency measure information of projects, in a program activity-tracking database (by KEMA and program contractors)
 - Documentation of program implementation activities in monthly progress reports (by SDREO and KEMA)
 - Review and analysis of project information in the program activity-tracking database (by Nexant)
 - Verification of project baselines as reported in approved proposals and project completions as reported in submitted construction completion forms through pre- and post-installation site inspections of all projects (by KEMA)
 - “Audit” of KEMA’s project level baseline information verification activities through sampling project documents and pre-installation site inspections of a sample of 11 projects (by Nexant)
 - “Audit” of KEMA’s project level installed measure information verification activities through sampling project documents and post-installation site inspections of a sample of 11 projects (by Nexant)
- 3) Communication of EM&V findings through:
 - Monthly EM&V progress reports (by Nexant)
 - Annual EM&V progress report (by Nexant)
 - EM&V Final Report (by Nexant)

Baseline Information

Program contractors will input project and measure data into a program activity-tracking database during program activities. The program implementer will conduct pre-installation inspections of all project proposals to verify the reported baseline equipment and operations data. Nexant will review and analyze project baseline information and assumptions in the program database. Nexant will verify the accuracy of the program implementer’s project level baseline information verification activities through the conduct of pre-installation inspections of a sample

of projects. The SDSU SSRL call center will collect additional baseline information, including participant confirmation of operating hour estimates, via a post-participation survey of a sample of participants. Sample results will be extrapolated to adjust, if warranted, the aggregate baseline information of the population of projects. The combination of data gathering and analysis efforts will document and verify baseline equipment and operations data and assumptions.

Energy Efficiency Measure Information

Program contractors will input project and measure data into a program activity-tracking database during program activities. The program implementer will conduct post-installation inspections of all project proposals to verify the installation of proposed measures as reported in submitted construction completion forms. Nexant will review and analyze project measure information and assumptions in the program database. Nexant will verify the accuracy of the program implementer's project level installed measure information verification activities through the conduct of post-installation inspections of a sample of projects. Sample results will be extrapolated to adjust, if warranted, the aggregate measure information of the population of projects. The combination of data gathering and analysis efforts will document and verify installed measure data and assumptions.

After the third month in each quarter, Nexant will review, analyze, aggregate, and report (in the corresponding month's EM&V progress report) the measure data in the program activity-tracking database.

Measurement and Verification Approach

Measurement and verification of the claimed energy savings of the BEST program will be based on the following EM&V activities:

- Review and analysis of project baseline and measure data in the program activity-tracking database (by Nexant)
- Verification of the accuracy of program contractor reported project baseline and installed measure information through pre and post-installation inspections of all projects (by KEMA)
- Verification of the accuracy of KEMA's inspections of project baseline information through pre-installation inspections of a sample of projects (by Nexant)
- Verification of the accuracy of KEMA's inspections of project installed measure information through post-installation inspections of a sample of projects (by Nexant)
- Survey of a sample of participants to assess free-ridership and verify operating information (by SDSU SSRL)

In the annual progress report and final report, Nexant will review, analyze, and recommend adjusting, if necessary, the program implementer's assumptions, calculations, and data verification approaches used in estimating project and program demand reduction and energy savings. Both annual and lifetime savings impacts will be provided.

In the final report, Nexant will review, analyze, and recommend adjusting, if warranted, the program administrator and program implementer calculations of the cost-effectiveness of the

program based on the TRC and participant tests as presented in the latest version available of the BEST program budget workbook.

Site Inspection Strategy

KEMA will conduct pre- and post-installation inspections of all projects (100% confidence/0% precision) to verify baseline information and the installation of project measures as specified in project documents (e.g., existing equipment inventories, proposals, work orders, project completion reports). Site inspections will include verification and/or assessment of the following information:

- Baseline equipment counts, types and capacities
- Facility operations, including operating hours
- Comprehensiveness of project proposals,
- Completion of the retrofit per the project proposal

In the fourth quarter of 2004, Nexant will “audit” the accuracy of the program implementer’s project level baseline verification activities through the conduct of pre-installation inspections of a sample of 11 projects (80% confidence, 20% precision, based on a large population and coefficient of variation of 0.5). The audit will include a review of project documents and information in the program database. During the site inspections Nexant will confirm existing equipment types, counts, and rated capacities (and take spot load measurements, if rated capacity is unavailable), and conduct interviews with facility personnel to confirm project information, such as estimated operating hours (the telephone survey of participants will also confirm operating hours estimates for a sample of participants).

Nexant will conduct post-installation inspections of a sample of 11 projects (80% confidence, 20% precision) to “audit” the accuracy of the program implementer’s project level installed measure verification activities. During the site inspections Nexant will confirm installed measure types and counts, and confirm that the measures and host customer remain in operation.

The samples of projects for pre and post-installation inspection will be chosen randomly from the program population of active (including completed) projects. The analysis of pre- and post-inspection results will focus mainly on lighting measures, as the energy savings from lighting measures is projected to represent almost 80% of the annual kWh savings goals of the program. The analysis of non-lighting measures, beyond visual confirmation of baseline equipment and installed measures, will involve the review of program assumptions, program implementer supplied work papers, and contractor supplied project and measure documentation.

Gross Savings Analysis

The BEST program proposal generation software automatically calculates the gross savings of projects based on the project data input by program contractors and verified through site inspections conducted by the program implementer. The proposal software has built-in assumptions of demand per unit for various types of existing equipment and for proposed measures. Program contractors input the number and type of baseline equipment, the estimated operating hours of the equipment, and the proposed retrofit measure types and numbers. The

proposal software calculates project demand reduction and annual energy savings based on the difference in demand between the retrofit measures and the baseline equipment multiplied by the estimated operating hours. The proposal software also calculates total project costs and incentive amounts based on standard measure costs per measure unit and incentive rates per kW reduction or unit by measure type, both prices set in advance by the program.

Nexant will review the program assumptions (e.g., eligible measures, standard measure costs, incentive pricing, stipulated base equipment and measure demand) for reasonableness. To inform the review, Nexant will conduct a literature search to review relevant market studies and EM&V reports of other similar programs (e.g., SDG&E Easy Turnkey program), in addition to reviewing the 2002-2003 EM&V final report of the BEST program. The telephone interviews of program contractors, and the survey of participants, will also include questions on the reasonableness of program assumptions.

After the third month of each quarter, Nexant will review, analyze, aggregate, and report (in the corresponding month's EM&V progress report) the projected demand reduction and annual energy savings of the program for active (including completed) projects in the program activity-tracking database.

In the EM&V final report of the 2002-2003 BEST program, post-installation inspections confirmed the installation of all proposed measures as reported in the construction completion forms for the sample of projects. Operating hour data collection of a sample of projects, and the survey of participants, confirmed the reasonableness of using business hours as a proxy for the operating hours of the baseline equipment and installed measures (particularly lighting measures). Because EM&V activities of the 2002-2003 BEST program started well after the start of the program, the conduct of pre-installation inspections of a sample of projects was not possible. The EM&V activities of the 2004-2005 year will include a special emphasis to conduct pre-installation inspections of a sample of projects to "audit" the program implementer's project level verification, and to assess the accuracy, of baseline information.

Nexant will recommend adjustments, if warranted, to the claimed gross savings of the program based on the review of program assumptions, the review and analysis of data in the program activity-tracking database, and the findings of the pre and post-installation inspections of samples of projects.

The M&V approach as described above is consistent with the IPMVP M&V Option A: Partially Measured Retrofit Isolation. The program implementer will conduct pre-installation and post-installation site inspections of all projects to verify baseline equipment and installed measure, and operating information. The kW load of baseline equipment and installed measures will be based on the nameplate rating for specific measures as listed in the program equipment inventory list (based on accepted published data, such as the DEER database and other public benefit programs, such as the Statewide SPC program). Operating hours of the equipment will be based on the business hours of the host customer with adjustment after contractor and program implementer discussion with host customer representatives. Due to the limited EM&V budget, the EM&V consultant will conduct additional pre-installation and post-installation site inspections of a sample of projects, including taking spot kW measurements, involving lighting measures (lighting measures represented 93% of the energy savings in the 2002-2003 BEST

program, and are projected to represent almost 80% of the energy savings in the 2004-2005 BEST program). For non-lighting measures, the EM&V consultant will review the work papers of the program implementer used to establish kW, therm, operating hour, and energy savings calculations. During site inspections, the EM&V consultant will discuss operating hour assumptions with the sample of host customer representatives, and the survey of participants will include questions to test the reasonableness of using adjusted business operating hours as a proxy for equipment operating hours (note: there is insufficient EM&V budget to collect and analyze operating hour data through direct measurement over time of a sample of projects). The combination of site inspections, kW spot measurements, and discussion with and survey of participants regarding operating hours is consistent with the partial measurement and engineering estimation requirements of IPMVP Option A.

The following table (Table 5.1 of the BEST PIP) presents the projected type and number of measures to be installed in the program:

Measure Description	No. of Units	Gross Annual Energy Savings per Unit (kWh)	Total Annual Gross kWh Savings	Total Annual Gross kW Savings	Gross Annual Energy Savings Per Unit (Therms)	Gross Annual Therm Savings
Compact Fluorescent Lamps (screw-in) – Interior	371	3,500	1,297,150	330		
Compact Fluorescent Lamps (screw-in) – Exterior	13	4,380	56,940	0		
Fluorescent – Interior	713	3,500	2,495,470	635		
Fluorescent – Exterior	8	4,380	35,337	0		
Fluorescent – delamp	931	3,500	3,258,500	829		
LED Exit Signs (Retrofit or New)	79	8,760	693,488	95		
Occupancy Sensors	397	1,050	416,850	0		
Photocells	40	4,380	175,200	40		
Window Film	31	15	465	1		
Programmable Thermostat	30	2,000	60,508	0	545	16,489
Humidistat Controls	315	2,502	788,501	0		
Miscellaneous Refrigeration	396,179	1	396,179	45.23		
Vending Controls	79	1,589	125,531	0		
Custom Gas	15,833				1	15,833
Custom Electric	316,711	1	316,711	90.49		
Custom Lighting – Interior	79	3,500	277,078	70		
Custom Lighting – Exterior	8	4,380	35,337	0		
CFLs (hardwired) – Interior	40	3,500	139,422	35		
CFLs (hardwired) – Exterior	3	4,380	13,251	0		
Total			10,581,919			32,322

Net Savings Analysis

An estimate of free-ridership, quantified in a net-to-gross ratio for the BEST program, will be used to adjust gross savings to net savings. Nexant will include questions in the participant survey instrument (the survey to be conducted by the SDSU SSRL call center) to assess the level of free-ridership in the program. The survey of a sample of participants will determine whether participants would have proceeded with the installation of energy efficiency measures without participation in the program. The resulting estimate of net savings will represent the savings that are attributable to the program, meaning, the savings would not have been achieved without the program.

Cost-effectiveness Analysis

In the final report, Nexant will review the program administrator and implementer calculations of the cost effectiveness of the program based on the Total Resource Cost (TRC) and Participant Cost tests presented in the latest version available of the program budget workbook, including the comparison of the projected budget to the actual expenditures of the program. Nexant will advise on any issues and recommend any needed adjustments to the calculations based on our review of data in the program activity tracking database and resulting from interviews, surveys, and site inspections

Evaluation Approach

The evaluation of program process and implementation will be largely based on the following EM&V activities:

- In-person interviews w/ administrator (by Nexant)
- In-person interviews w/ implementer (by Nexant)
- Telephone interviews w/ SDREP members (by Nexant)
- Telephone interviews w/ program contractors (by Nexant)
- Survey of participants (by SDSU SSRL)

An emphasis will be placed on testing the program theory and design (objective, target market sector, market barriers addressed, program strategy, projected activities and outcomes), examining the appropriateness of different implementation roles (administrator, implementer, SDREP members, contractors), identifying what is working and not working, comparing actual implementation to design and plan, and assessing participant value of program elements and satisfaction with the program.

Nexant will create a program logic chart based on an examination of the program design including a review of objectives, program theory, targeted market barriers, training and marketing material, outreach activities, educational materials developed for the program, program activities, and implementation plan. Nexant will begin with a review of program documentation followed by interviewing program administrator and implementer staffs. The interviews will confirm our understanding of the program design and theory and identify appropriate performance metrics (e.g., process metrics, activity and participation data to be tracked and reported by SDREO and participants) for the program.

Nexant staff will design all interview and survey instruments. Nexant will conduct telephone interviews with representatives of all SDREP members and program contractors. The SDSU SSRL call center will conduct a survey of a sample of participants.

Questions that we will seek to answer during interviews, written survey, and reviews of materials, activities, and results of the program include the following:

- Was the program theory and approach, including the stated market barriers and the program elements to reduce the stated market barriers, an accurate reflection of target participant issues and needs?
- Was the program implemented as planned?
- Were the designated roles of the program administrator, implementer, SDREP members, and contractors appropriate and effective?
- Did the program achieve the projected type and level of participation?
- Was the program a significant factor in raising the awareness and gaining decisions of participants to implement the energy efficiency and demand reduction measures?
- What were the relative values to participants of the program elements/offerings?
- Were there any unanticipated outcomes/results?
- What changes/improvements would make the program better?

The assessment of the effectiveness of the program will be based on the results of in-person and telephone interviews, tabulated results from the telephone survey or participants, review of the monthly program progress reports, and review of data in the program activity-tracking database.

Telephone Survey Strategy

Nexant will interview representatives of all SDREP members and program contractors (100% confidence/0% precision).

The SDSU SSRL call center will conduct a survey of a sample of participants to assess program effectiveness, participant value of program elements/offerings, participant satisfaction with the program, and the level of free-ridership in the program (to inform net-to-gross estimates). In addition, the survey will be used to solicit information on project comprehensiveness and spillover effects (associated with participants), and to confirm previous information, such as reported operating hours.

The telephone survey will target up to 68 completions in each 4th QTR of 2004 and 2005 (representing a 90% confidence level with a 10% level of precision, assuming a large population and a coefficient of variation of 0.5).

Reporting Schedule

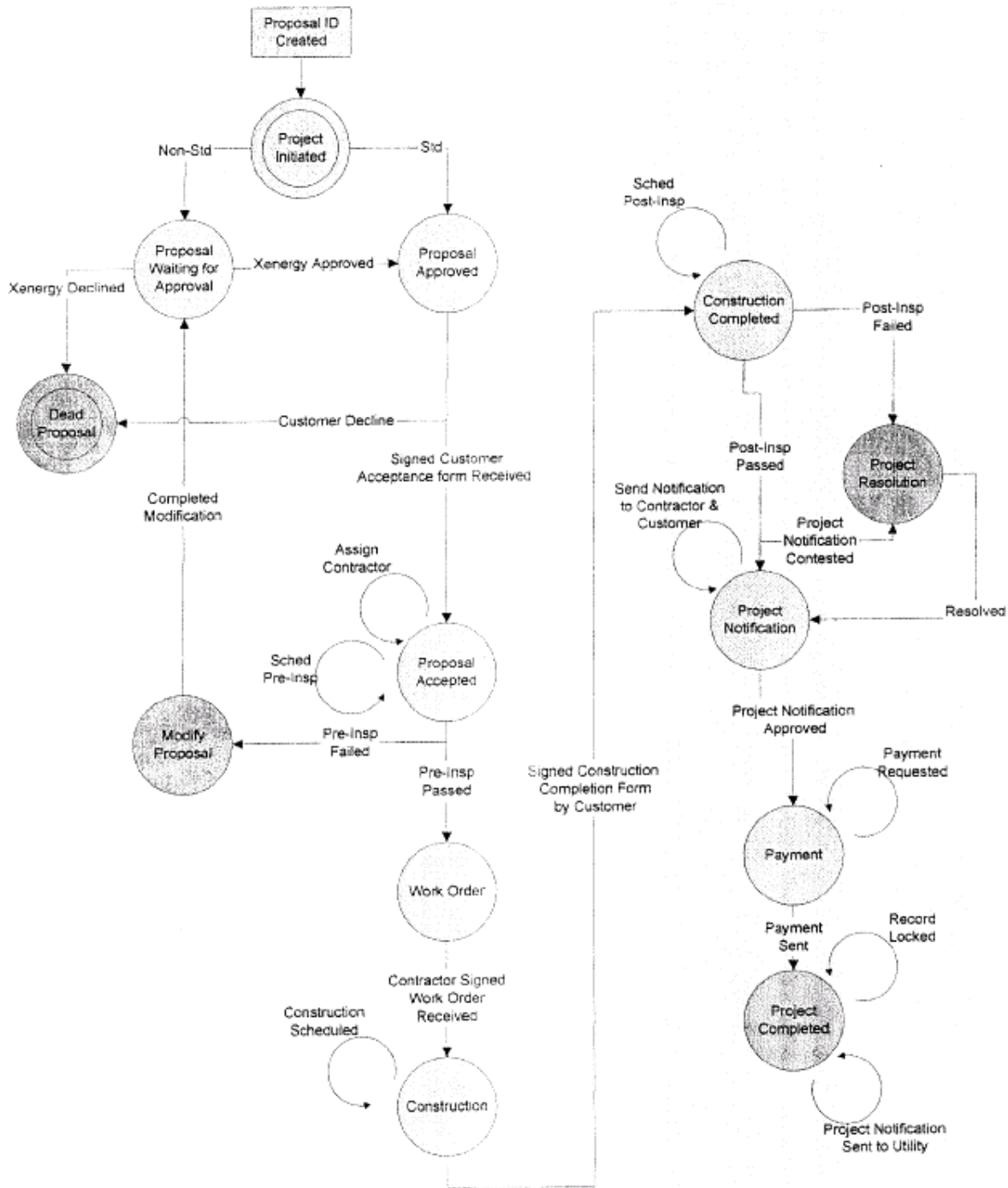
Nexant will develop a standard reporting template and submit monthly EM&V progress reports. In the first quarter of 2005, Nexant will submit an annual EM&V progress report. In the first quarter of 2006 Nexant will submit a draft EM&V report and by April 15, 2006, Nexant will submit an EM&V final report.

2004-2005 Business Energy Services Team (BEST) Program Logic Chart

Objective	Market Barriers Addressed	Market Sector and Program Strategy	Program Activities/ Outputs	Outcomes		Outcome Metrics		Savings Metrics
				SHORT TERM (1 year)	LONGER TERM (2- 5 years)	SHORT TERM (1 year)	LONGER TERM (2- 5 years)	Annual Energy-Savings
Maximize implementation of cost-effective high efficiency lighting measures, while addressing some HVAC, refrigeration, gas measures, and other customized measures in the small business market	Lack of access to capital for first costs High hassle or transaction costs High information access and search costs Performance uncertainty and hidden costs Split incentives Lack of access to financing	Eligible participants: 20-100 kW SDG&E customer Non-SDG&E "A" rate schedule Target participants: < 10 employees Leased space Non-English Program promotion through SDREP members Outreach, project development and completion by contractors, including performance guarantees Use of rebate-type financial	Contractor recruiting/training workshops Collaboration with SDREP members (e.g., marketing and outreach - presentations, distribution of program materials, at community events) # Businesses contacted # Project proposals # Pre-installation inspections # Applications processed # Post-installation inspections # Completed installations	Overall participation HTR small businesses => 67% of participants Increase in # multiple end-use measure projects Increase understanding of energy usage/efficiency opportunities by participants SDREP member marketing and outreach of BEST program	Contemplation of additional energy savings projects w/o program by participants Increased SDREP member involvement in regional energy program implementation	Program participation documented in program activity tracking database - # of HTR - # of Multiple end-use measure projects Level of free-ridership quantified by participant surveys Participant reported increased understanding of energy usage/efficiency opportunities Co-branded program marketing (e.g., SDREP member/BEST marketing materials communicated through existing member channels)	Participant reported contemplation of additional projects w/o program SDREP member reported level of involvement in regional energy program implementation	PY-04-05: Gross: 10,580,000 kWh 32,322 therms Net: 10,158,643 kWh 31,029 therms Net Coincident Peak Demand Savings: 5,375 kW Program Cost-effectiveness Participant Test TRC

Objective	Market Barriers Addressed	Market Sector and Program Strategy	Program Activities/ Outputs	Outcomes		Outcome Metrics		Savings Metrics
				SHORT TERM (1 year)	LONGER TERM (2- 5 years)	SHORT TERM (1 year)	LONGER TERM (2- 5 years)	Annual Energy-Savings
		incentives averaging more than 80% of standardized project costs with caps to promote HTR and multi-end use projects Provision of "one stop" service, including: Marketing Energy Education Site-specific Energy Analysis Financial Incentives Equipment procurement and installation						

Figure 2-1
Project Process Flowchart



SDREO Business Energy Services Team (BEST) Program Survey, July 2006

INT. Hello, my name is _____. May I speak with...? **[WHEN SPEAKING WITH LISTED RESPONDENT:]** We're calling to follow-up on your participation in the San Diego Regional Energy Office's Business Energy Services Team, or BEST, program. We have some questions about your experience with that program since the summer of 2004. Are you the person most knowledgeable about your company's participation in this program, which most likely involved working with staff from Kema-Xenergy (who implemented the program)? **[IF NOT, OBTAIN NEW NAME AND PHONE NUMBER; UPDATE RECORD; RECONTACT CORRECT PERSON; IF YES:]** Do you have about ten minutes right now? **[SCHEDULE CB IF NEEDED]**

Q1. Can you please tell me what type of business setting you work in? **[READ IF NEEDED TO CLARIFY; PROBE RESPONSES SUCH AS "OFFICE", "RETAIL", "WAREHOUSE" AND "HOSPITAL" BEFORE CODING:]**

- 1 - OFFICE: SMALL
- 2 - MEDIUM
- 3 - HIGH-RISE
- 4 - WAREHOUSE
- 5 - BANK
- 6 - RESTAURANT
- 7 - LOUNGE/CLUB
- 8 - PARKING STRUCTURE
- 9 - RETAIL: SMALL
- 10 - LARGE
- 11 - SUPERMARKET, MINI-MARKET
- 12 - WAREHOUSE: REFRIGERATED
- 13 - NON-REFRIGERATED
- 14 - SCHOOL (K-12)
- 15 - COLLEGE/UNIVERSITY
- 16 - HOSPITAL: ACUTE CARE
- 17 - LONG-TERM CARE
- 18 - OTHER, SPECIFY: _____
- 99 - DK/REF

Q2. How many employees currently work at this business location on a regular basis?

- _____ EMPLOYEES
- 9997-9997 OR MORE
- 9999-DK/REF

Q3. Do you own or rent your facility?

- 1 - OWN
- 2 - RENT/LEASE
- 9 - DK/REF

Q4. Which of the following energy efficiency improvements did your business make as a result of participation in the BEST program.

	<u>YES</u>	<u>NO</u>	<u>DK/REF</u>
1) lighting efficiency retrofits?	1	2	9
2) programmable controls or energy management systems?	1	2	9
3) commercial refrigeration measures?	1	2	9
4) window film to reduce solar heat gains?	1	2	9
5) outside air controls to help reduce heating and cooling needs?	1	2	9
6) Were any other improvements made?			

99-NO/DK/REF

Q5. A large part of the cost of this project was covered by California ratepayer funds. A typical project like the one completed at your site would usually cost about 5 times what you paid to have it completed through the BEST program. If you had to pay the entire cost yourself, do you think you would have completed this project on your own within the next two years?

- If no, proceed to Q6.
 - If yes, maybe, or not sure, ask Questions a-c.
- a. How long have you known that by doing this project, you could save electricity?
 - b. How did you learn about this type of technology/project?
 - c. When do you think you [would have, might have] done the project on your own?

Q6. Had you completed any energy efficiency projects before this one?

- If no or not sure, proceed to Q7.
 - If yes, ask Questions a-c.
- a. What kind of project was it?
 - b. When did you have it done?
 - c. Was it through a utility rebate program, or on your own?

Q7. Do you have plans to do any more energy efficiency projects in the near future?

Q8. How did you first learn about the BEST Program? **[READ IF NEEDED TO CLARIFY, RECORD ONLY ONE]**

- 1 - FRIEND / BUSINESS CONTACT
- 2 - COMMUNITY ORGANIZATION / INDUSTRY ASSOC / CHAMBER OF COMMERCE, SPECIFY: _____
- 3 - COMMUNICATION FROM SDREO, PROGRAM ADMINISTRATOR
- 4 - COMMUNICATION FROM KEMA-XENERGY, PROGRAM IMPLEMENTER
- 5 - COMMUNICATION FROM CONTRACTORS AND/OR VENDORS (PROVIDERS OF ENERGY EFFICIENCY EQUIPMENT AND SERVICES)
- 6 - DIRECT CONTRACTOR / VENDOR CONTACT (WALK-IN, TELEPHONE CALL)
- 7 - OTHER, SPECIFY: _____
- 9 - DK/REF

Q9. What is the best way to reach you to communicate information about energy efficiency and related programs, such as BEST? **[RANDOMLY READ ONLY IF NEEDED TO CLARIFY]**

- 1 - TELEPHONE
- 2 - U.S. MAIL / DIRECT MAIL
- 3 - EMAIL
- 4 - INDUSTRY PUBLICATIONS / NEWSLETTERS
- 5 - OTHER, SPECIFY: _____
- 9 - DK/REF

Q10. I'm going to read a list of possible obstacles to starting an energy efficient project. For each one, please tell me whether: **[READ THREE OPTIONS BELOW]**

The first one is... **

[RECAP AS NEEDED:] Is this not an obstacle; would you start without assistance but aspects of the project may be affected because of this obstacle; or would this obstacle cause you to not start this project without assistance?

1 = this item would not be an obstacle in your pursuing energy efficient projects;

2 = you may start energy efficiency projects without assistance from programs such as BEST, but the type, size, and/or timing of projects may be affected because of this obstacle; or

3 = without assistance from BEST you will not start energy efficient projects because of this particular obstacle?

9 = DK/REF/NEITHER

		NOT AN OBSTACLE	MAY START W/O BEST	W/NOT START	DK/REF
1)	available cash capital for project costs?	1	2	3	9
2)	available financing or loans for project costs?	1	2	3	9
3)	hassle or transaction costs, such as management time, contracting, or business disruption?	1	2	3	9
4)	information access and search costs, such as the time it takes to find information about more efficient equipment that would work for you?	1	2	3	9
5)	uncertainty about "hidden" capital and operating costs, potential increases in costs for special maintenance or replacement parts?	1	2	3	9
6)	uncertainty about functional performance (i.e., light quality, cooling ability)?	1	2	3	9
7)	uncertainty about actual or quantifiable energy savings?	1	2	3	9
8)	different goals for a project, often called "split incentives" (i.e., owners of facilities and equipment want to limit capital investment vs. tenants want to reduce energy costs)?	1	2	3	9
9)	Are there any other <u>major</u> , potential obstacles to your business' pursuit of energy efficiency that I haven't mentioned?				

99-NO/DK/REF

Q11. Now I'm going to mention some of the BEST program elements. For each one, please tell me if you found it valuable, or not valuable, or if it did not apply to your business. The first one is...**

	<u>VALUABLE</u>	<u>NOT VAL</u>	<u>NOT APP/DK/REF</u>
1) educational information provided by the BEST program (i.e. info on program services, eligibility, how to participate)?	1	2	9
2) other energy efficiency information of interest to you?	1	2	9
3) site audit?	1	2	9
4) project proposal with explanation of benefits?	1	2	9
5) equipment procurement and installation?	1	2	9
6) rebates that offset project costs?	1	2	9
7) Kema-Xenergy (program implementer) review of contractor and/or vendor work or activity?	1	2	9
8) SDREO (program administrator) sponsorship of program?	1	2	9

Q12. Are there any other program services or elements that would be valuable to you?

99-NO/DK/REF

Q13. Thinking now about the BEST program rebates in general...
[READ EACH LEVEL UNTIL RESPONSE IS "yes", THEN GO DIRECTLY TO Q14; IF TOLD "IT DEPENDS ON THE COST OF THE PROJECT", CLARIFY WITH:] Please consider a project with costs of at least \$500.

	<u>YES</u>	<u>NO</u>	<u>DK/REF</u>
1) Would you pursue an energy efficiency project <u>without</u> rebates?	1	2	9
Would you pursue an energy efficiency project if the rebates were...			
2) up to 25% of project costs?	1	2	9
3) 26 to 50% of project costs?	1	2	9
4) 51 to 75% of project costs?	1	2	9
5) more than 75% of project costs?	1	2	9

Q14. Can you tell me your hours of business on...

	<u>OPEN AM</u>	<u>CLOSE PM</u>	<u>CLOSED</u>	<u>DK/REF</u>
1) Monday?	_____	_____	97	99
2) Tuesday?	_____	_____	97	99
3) Wednesday?	_____	_____	97	99
4) Thursday?	_____	_____	97	99
5) Friday?	_____	_____	97	99
6) Saturday?	_____	_____	97	99
7) Sunday?	_____	_____	97	99

Q15. In terms of the operating hours of your energy efficient equipment installed through the BEST program, would you say... **[IF DIFFERENT HOURS FOR DIFFERENT TYPES OF EQUIPMENT, RESPOND FOR EQUIPMENT WITH THE HIGHEST KILOWATT HOURS USED]**

- 1 - the equipment operates more hours than the business hours,
- 2 - the equipment operates fewer hours than the business hours,
- 3 - or the equipment operates the same hours
as the business hours? -----> **GO TO EDU**
- 9 - DK/REF -----> **GO TO EDU**

Q15a. **[IF MORE/FEWER:]** On average, how many {more/fewer} hours each day (does the energy efficient equipment operate, compared to your business hours)?
[CONFIRM RECORDING DIFFERENCE, NOT TOTAL HOURS]

_____ DIFFERENCE IN HOURS/DAY
99-DK/REF

EDU. In closing, the following questions are for comparison purposes only. What is the highest grade or year of school that you have completed and received credit for...

- 1 - high school or less;
- 2 - at least one year of college, trade or vocational school;
- 3 - graduated college with a bachelor's degree; or
- 4 - at least one year of graduate work beyond a bachelor's?
- 9 - DK/REF

PHN. Those are all the questions I have.
[ONLY IF NOT ON CATI:] I'd like to confirm that I reached you at...

[VERIFY AND INSERT TELEPHONE NUMBER:] _____

SDG&E Program Energy Impact Reporting for 2004-2005 Programs

Program ID*:		1285-04						
Program Name:		Business Energy Services Team (BEST)						
Year	Calendar Year	Ex-ante Gross Program-Projected Program MWh Savings (1)	Ex-Post Net Evaluation Confirmed Program MWh Savings (2)	Ex-Ante Gross Program-Projected Peak Program MW Savings (1**)	Ex-Post Net Evaluation Confirmed Peak MW Savings (2**)	Ex-Ante Gross Program-Projected Program Therm Savings (1)	Ex-Post Net Evaluation Confirmed Program Therm Savings (2)	
1	2004	0	0	N/A	0	0	0	
2	2005	10,582	980	N/A	0.307	32,322	0	
3	2006	10,582	4,614	N/A	1.012	32,322	0	
4	2007	10,582	6,065	N/A	1.357	32,322	0	
5	2008	9,228	5,973	N/A	1.307	32,322	0	
6	2009	9,228	5,867	N/A	1.274	32,322	0	
7	2010	8,832	5,822	N/A	1.260	32,322	0	
8	2011	8,832	5,822	N/A	1.260	32,322	0	
9	2012	8,832	5,822	N/A	1.260	32,322	0	
10	2013	8,240	5,822	N/A	1.260	32,322	0	
11	2014	8,240	5,822	N/A	1.260	32,322	0	
12	2015	8,239	5,822	N/A	1.260	32,322	0	
13	2016	8,179	5,803	N/A	1.235	15,833	0	
14	2017	7,390	5,524	N/A	1.215	15,833	0	
15	2018	7,390	3,712	N/A	1.092	15,833	0	
16	2019	7,390	3,428	N/A	1.070	15,833	0	
17	2020	7,265	3,428	N/A	1.070	15,833	0	
18	2021	0	2,818	N/A	0.830	0	0	
19	2022	0	1,107	N/A	0.302	0	0	
20	2023	0	0	N/A	0	0	0	
TOTAL	2004-2023	139,028	84,254			434,702	0	

*Please complete this form for the SDG&E program ID included in the evaluation.

**Please include the definition of Peak MW used in the evaluation.

Definition of Peak MW as used in this evaluation:

Coincident Peak MW

Note, change the Program ID Number on the worksheet tabs (below), so that it matches the Program ID Number of the program being evaluated.

1. Gross Program-Projected savings are those savings projected by the program before NTG adjustments.
2. Net Evaluation Confirmed savings are those documented via the evaluation and include the evaluation contractor's NTG adjustments.