

**EVALUATION
OF PRESCRIPTIVE
LIGHTING
PROGRAM**

**Final Report
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Sacramento Municipal Utility District

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EXECUTIVE SUMMARY

This report presents and discusses the results from an evaluation of the Prescriptive Lighting Program that Sacramento Municipal Utility District (SMUD) offered to its commercial customers. There were three major components to this evaluation:

- A persistence study was conducted to measure the extent to which efficient lighting measures installed under the lighting program during 2001-2002 remain in place and operational.
- A market potential study was performed to develop estimates of the potential for a commercial lighting program, specifically for commercial customers with demand under 300 kW.
- A process and market study was also conducted in conjunction with the market potential study in order to identify alternative program designs for a commercial lighting program in which participating customers contribute a greater portion of project cost.

For the persistence study, a sample of 142 facilities was selected from among the 743 sites that participated in the Prescriptive Lighting Program in 2001 or 2002. The sites in the sample were visited on-site to collect data on the retention of the lighting measures installed through the program. Retention rates were determined for each type of measure by dividing the quantity of like-equipment observed by field staff as being in use and without burn out by the quantity identified by SMUD as being installed during 2001-2002. Table ES-1 shows the quantity of each measure installed under the program at the surveyed sample sites, the quantities of each measure identified by field staff as being operational and in use, and the measure retention rate.

Table ES-1-1. Retention Rates for All Lighting Measures

<i>Type of Measure</i>	<i>Number of Measures Installed</i>	<i>Number of Measures Retained and In Use</i>	<i>Percentage of Measures Retained and In Use</i>
1 Lamp T-8	147	104	70.4%
2 Delamp 4 ft. T-8	564	130	23.0%
2 Delamp T-8	5,581	3,935	70.5%
2 Lamp 4 ft. T-8	4	4	100.0%
2 Lamp T-8	1,126	929	82.5%
3 Delamp T-8	48	28	58.3%
3 Lamp T-8	26	22	84.6%
4 Delamp 4 ft. T-8	150	134	89.3%
4 Lamp 4 ft. T-8	446	373	83.7%
4 Lamp T-8	205	147	71.7%

<i>Type of Measure</i>	<i>Number of Measures Installed</i>	<i>Number of Measures Retained and In Use</i>	<i>Percentage of Measures Retained and In Use</i>
40 - 59 Screw-in Reflector	160	18	11.3%
60 - 75 Hardwired	12	8	66.7%
60 - 75 Screw-in Non-Reflector	1,077	511	47.5%
60 - 75 Screw-in Reflector	1,147	152	13.3%
76 - 100 Hardwired	9	9	100.0%
76 - 100 Screw-in Non-Reflector	1,574	870	55.3%
76 - 100 Screw-in Reflector	779	209	26.8%
Incandescent Exit Sign LED Kit	240	192	80.0%
Occupancy Sensor Ceiling Mount	4	4	100.0%
Occupancy Sensor Wall Switch	38	23	60.5%
Other fixtures, Drum or Strip	303	293	96.7%
Other fixtures, Wrap or Troffer	149	142	95.3%

Data for the market potential analysis were collected through interviews at 78 sites that had not participated in the Prescriptive Lighting Program. The key findings from the market potential study were as follows:

- About 60 percent of the buildings in the sample were owned and the rest were leased.
- Places of worship, motels, distributors, managed properties, industrial, and offices tended to be owned. Grocery and convenience stores, automotive establishments, service establishment, restaurants, schools tend to be leased
- Sixty percent of lessees had leases with a term of three years or more and 40 percent had leases with terms of five or more years. At least theoretically, this should allow time for payback on lighting investments.
- Sixty percent of lessees had more than two years left in their lease.
- If the typical payback on a lighting upgrade were two years, then 50 to 60 percent of lease customers would be able to recover the costs of a lighting upgrade before their lease expires. In actuality, a somewhat smaller number would consider upgrading because they would prefer an investment timeframe of more than two years to gain advantage from their investment.
- Eight-five percent of lessees can negotiate with the landlord to upgrade lighting systems. Depending on who pays the electric bill, the upgrade could reduce energy costs to the landlord or the tenant. In many instances the tenant may need to convince the landlord to upgrade the lighting because the landlord pays the bill.
- Overall, forty percent of the respondents had had experience with efficient lighting. Fifty three percent of owners and 19 percent of lessees had previous experience with installing efficient lighting.

- Distributors, motels, offices, places of worship, and grocery and convenience establishments had the highest percentage of firms with prior experience with efficient lighting.
- Most of the lessees who had experience with efficient lighting had occupied their space for three or more years.
- Those who had experience with efficient lighting had installed T8s and CFLs. There was little experience with other technologies including exit signs.
- Respondents were asked about different kinds of investments typical of small and medium sized businesses from \$2,000 to \$7,500. Overall, lighting was the first choice of only four percent of respondents. The first choice of owners was refurbishing the interior and signage. The first choice of lessees was products and services and signage. Lighting is a low priority for most owners or lessees.
- If owners knew that the payback for lighting was two years, then 30 percent would make that their first choice. Knowledge that an upgrade has a two-year payback did not influence lessees.
- About a quarter of owners and nine percent of lessees plan to upgrade in the future. Those who had previously upgraded lighting are most likely to say that they would do so again.
- Distributors, grocery and convenience, restaurant, and motels are the most likely to upgrade lighting in the future.
- When asked the basis for decisions about upgrading lighting, the availability of cash was the most common criterion, followed by return on investment, and first cost. Payback was the least often mentioned. This is important because efficiency programs tend to emphasize payback, the least considered criterion.
- Only 40 percent were willing to provide a limit on what they would be willing to pay for a lighting upgrade. The preponderance of these respondents who provided a limit was willing to pay a \$1,000 or more. These may also be respondents who were willing to consider an upgrade.
- About half of the owners and less than half of the lessees were aware of SMUD's commercial lighting program. Thus, there is a lack of awareness among a large number of potential program participants. This lack of awareness may represent a failure to communicate on SMUD's part but it may also represent the lack of salience of energy efficiency and lighting for owners and lessees.
- A key finding is that 69 percent of the owners and 41 percent of the lessees would probably do a lighting upgrade project if assured by SMUD that a lighting upgrade would payback in two years. Such a guarantee might be an alternative or a complement to incentive programs.
- Overall, this study suggests that lighting upgrades are not high on the priority list of small and medium businesses. Even so, there is a core of these businesses that plan to upgrade in the future. Key factors in the decision are the availability of cash and return on investment. Payback is not a strong motivational argument with small and medium businesses. Other

studies have consistently shown that participants and potential participants in programs are wary of estimates of payback. This study suggests that if assured of a two-year payback, interest in the program would increase.

- Owners may be more easily convinced to participate than lessees. There are several reasons for this. Tenants may have limited timeframes for investment. Further, tenants may not always be responsible for the electric bill and therefore less interested in energy efficiency. Overall, the data seem to suggest that there is certain precariousness associated with a proportion of businesses that lease space. This may limit interest in investments in lighting and other efficient equipment.

A process and market analysis using conjoint analysis was also conducted. Customers were asked about their preferences among four direct payment options and three loan options. Pairwise comparisons of program options implied the following preferences among customers.

- With the four direct payment options, customers always prefer the option for which their direct payment is lower.
- Among the three loan options, customers preferred an option whereby SMUD gives customer a 48-month no-interest loan to install new lighting.
- In comparing direct payment options against the preferred loan option, customers strongly preferred direct payment options where the payment covered half or more of the installation cost. However, customers only slightly favored the direct payment option over the loan option when the direct payment covered 25 percent of the installation cost.

The results of the market and process study suggest that a lighting efficiency incentive program aimed at smaller commercial customers be designed that is low-cost, without a loan, requires minimal effort by customers, and emphasizes the energy savings. A program aimed at larger commercial customers should be designed to include a 48-month loan but give immediate savings.

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1. INTRODUCTION

This program evaluation report provides an analysis of the Prescriptive Lighting Program that Sacramento Municipal Utility District (SMUD) is offering to customers in its service territories. The purpose of the Prescriptive Lighting Program is to assist customers in making energy efficiency lighting replacements or improvements to their facilities.

There were three major components to this evaluation of the Prescriptive Lighting Program.

- A persistence study was performed to measure the extent to which measures installed under the program during 2001-2002 remain in place and functioning at the expected efficiency level.
- A market potential study was performed to develop improved estimates of the potential for a commercial lighting program, specifically for commercial customers with demand under 300 kW.
- A process and market study was conducted in conjunction with the market potential study to identify alternative program designs for a commercial lighting program in which participating customers contribute a greater portion of project cost.

For the persistence study, a sample of 142 sites was used for on-site data collection and analysis. The facilities in the sample were visited to determine if program-installed measures are still in place and properly installed as specified by program requirements. An on-site survey was administered to learn about changes in lighting equipment since 2001-2002. The total number of respondents to this survey was 129.

For the market potential, process and market studies, a sample 78 sites was used. Part of this sample included facilities that were in the sample for the CEC's Commercial Energy Use Survey (CEUS) for SMUD's service territory. (ADM collected the data for these CEUS sites.) These sites were visited to collect data on which to base the market potential, process and market study analyses. The primary goal of the survey was understand the threshold of incentives necessary to get respondents to increase the efficiency of the lighting in their facility.

This final report presents and discusses the methodology used and results achieved through this evaluation. The report is organized into the following sections.

- Chapter 2 presents the retention rates for the lighting measures as determined from the on-site data collection effort.
- Chapter 3 presents and discusses the results of the market potential analysis.
- Chapter 4 addresses the results of the process and market analysis.
- Appendix A contains descriptive tabulations.
- Appendix B contains copies of the forms used for the data collection.

2. ANALYSIS OF RETENTION FOR LIGHTING MEASURES

This chapter presents and discusses the results from analyzing retention rates. Summary statistics on the sites for which data are collected are presented in Section 2.1, while retention rates are presented in Section 2.2.

2.1 DATA COLLECTION PROCEDURES FOR PERSISTENCE STUDY

There were 743 sites that participated in the Prescriptive Lighting Program in 2001 or 2002, of which 111 sites participated in 2001 and 642 in 2002. The original sample design was to collect data for a sample of 135 facilities, of which 28 were participants in 2001 and 107 in 2002. The sample for the retention study from each year was stratified to include some sites with high energy savings, some with moderate savings, and some with low savings, ruling out a sample that had concentrations of sites with atypically high savings or atypically low savings.

In practice, some of the facilities for which data were to be collected were closed or not accessible. On-site visits were made to a total of 142 facilities. Out of these 142 sites, there were 13 (9%) where businesses located at the sites had closed or moved since 2001-2002 and the sites were unoccupied at the time of the site visit. Of the 13 sites at which businesses had closed or moved, no survey responses could be obtained. Table 2-1 shows how the sample of 142 sites was distributed by business type and by whether business had moved/closed or survey could be completed. Offices and retail stores which comprise about half of the total sample, account for about three-fourths of the sites that had moved or closed.

*Table 2-1. Disposition of Site Contacts by Business Type
and by Whether Survey Was Completed*

<i>Business Type</i>	<i>Number of Businesses Closed/Moved</i>	<i>Number of Surveys Completed</i>	<i>Totals by Business Type</i>
Church		10	10
Food/Liquor		8	8
Hotel		6	6
Medical Office	1	6	7
Miscellaneous.	1	33	34
Office	4	13	17
Restaurant	1	8	9
Retail Store	6	45	51
Totals	13	129	142

During the on-site visits, data were collected that could be used to determine the reason for measure removal/failure and the date when the removal/failure occurred. A copy of this form is provided in Appendix A.

The types of information collected for the analysis of persistence included the following:

- Are program-installed measures still in place and properly installed as specified by program requirements?
- If the measures are not in place and/or properly installed:
 - Were they removed, disconnected, broken, or damaged?
 - Why?
 - When were they removed/disconnected?
 - Were they removed as part of a larger change? What was that change?
 - What, if anything, replaced the measures?
- Are the measures in a good state of repair?
- Is there a specific maintenance schedule for each measure?
- Has the use of space surrounding the measure changed since installation? How?
- Is the equipment used differently than it was originally? Less? More? Has it been modified?
- Have there been business turnover and/or occupant changes?
- What are the customer and building characteristics?

Data for the facilities of the customers selected for the study sample were collected through on-site visits. Before the field staff went to a facility, they reviewed program data that SMUD had on the measures installed at that facility. These program data were used to establish the baseline information on lighting measures that were installed in the buildings under the Prescriptive Lighting Program. Changes from these data were indicative of building changes and component changeouts. These and other items of information were extracted from the program records and provided to the field staff to facilitate the site visits. This was needed so that the field staff could know what “was” to compare with what “is” at the site and thereby note or ask about any apparent changes. This review ensured that the field engineer was familiar with the facility and measures for which data were to be collected when he went on-site and that he appropriately allocated his time to collect data on those measures that were the primary subjects for the analysis.

2.2 ANALYSIS OF RETENTION RATES

The measures installed by contractors under the Prescriptive Lighting Program fell into three major categories:

- Replacing T-12 lighting fixtures with T-8 lighting fixtures;
- Replacing incandescent bulbs with compact fluorescent lamps (CFLs); and

- Other measures, including replacing incandescent exit sign lights with LED signs and installing occupancy sensors.

Retention rates were determined for each type of measure within these three categories by dividing the quantity of like-equipment observed by field staff as being in use and without burn out by the quantity identified by SMUD as being installed during 2001-2002.

Because verification of measure retention and condition could not be completed for the 13 sites at which businesses had closed or relocated, the number of measures removed, failed, or replaced at these sites is unknown. Accordingly, retention rates were analyzed for two sets of sites.

- A first analysis was made using data for all 142 sites, with lighting measures installed at closed sites being designated as not in use.
- A second analysis was made using data only for the 129 sites for which data collection could be completed.

2.2.1 Retention Rates: All Sites

This section provides the results of an analysis of measure retention rates that was made using data for all 142 sites. For this analysis, lighting measures installed at closed sites are designated as not being in use. Retention rates are reported first by type of measure and then by type of business.

2.2.1.1 Retention Rates by Type of Measure: All Sites

Retention rates by type of lighting measure when data for all surveyed sites are used are shown in Tables 2-2, 2-3, and 2-4.

- Table 2-2 shows the retention rates for T-8 fixtures that were installed to replace T-12 fixtures at the 142 sites. In the aggregate, the T-8 fixtures installed to replace T-12 fixtures had a retention rate of 70.0%.
- Table 2-3 shows the retention rates for CFLs that were installed to replace incandescent lamps. Retention rates are provided for both hardwired and screw-in CFLs. In the aggregate, the CFLs installed to replace incandescent lamps for the set of 142 sample sites had a retention rate of 38.0%.
- Table 2-4 shows the retention rates for several other lighting measures that were installed.

Table 2-2. Retention Rates for T8 Fixtures: All Sample Sites

<i>Type of Measure</i>	<i>Number of Fixtures Installed</i>	<i>Number of Fixtures Retained and In Use</i>	<i>Percentage of Fixtures Retained and In Use</i>
1 Lamp T-8	147	104	70.4%
2 Delamp 4 ft. T-8	564	130	23.0%
2 Delamp T-8	5,581	3,935	70.5%
2 Lamp 4 ft. T-8	4	4	100.0%
2 Lamp T-8	1,126	929	82.5%
3 Delamp T-8	48	28	58.3%
3 Lamp T-8	26	22	84.6%
4 Delamp 4 ft. T-8	150	134	89.3%
4 Lamp 4 ft. T-8	446	373	83.7%
4 Lamp T-8	205	147	71.7%
Totals	8,297	5,806	70.0%

Table 2-3. Retention Rates for CFLs: All Sample Sites

<i>Type of CFL</i>	<i>Number of CFLs Installed</i>	<i>Number of CFLs Retained and In Use</i>	<i>Percentage of CFLs Retained and In Use</i>
40 – 59W Screw-in Reflector	160	18	11.3%
60 – 75W Hardwired	12	8	66.7%
60 – 75W Screw-in Non-Reflector	1,077	511	47.5%
60 – 75W Screw-in Reflector	1,147	152	13.3%
76 – 100W Hardwired	9	9	100.0%
76 – 100W Screw-in Non-Reflector	1,574	870	55.3%
76 – 100W Screw-in Reflector	779	209	26.8%
Totals	5,008	1,904	38.0%

Table 2-4. Retention Rates for Other Measures: All Sample Sites

<i>Type of Measure</i>	<i>Number of Measures Installed</i>	<i>Number of Measures Retained and In Use</i>	<i>Percentage of Measures Retained and In Use</i>
Incandescent Exit Sign LED Kit	240	192	80.0%
Occupancy Sensor, Ceiling Mount	4	4	100.0%
Occupancy Sensor, Wall Switch	38	23	60.5%
Other Fixtures, Wrap or Troffer	149	142	95.3%

2.2.1.2 Retention Rates by Type of Business: All Sites

Retention rates for T8 fixtures and for CFLs were also calculated by type of business for the set of all 142 sample sites.

Table 2-5 shows the retention rates by business type for T-8 fixtures that were installed to replace T-12 fixtures at the 142 sites. The lowest retention rate (42.6%) occurred for offices.

Table 2-5. Retention Rates by Business Type for T8 Fixtures: All Sample Sites

<i>Business Type</i>	<i>Number of Fixtures Installed</i>	<i>Number of Fixtures Retained and In Use</i>	<i>Percentage of Fixtures Retained and In Use</i>
Church	1,972	1,845	93.6%
Food/Liquor	139	110	79.1%
Hotel	44	44	100.0%
Medical Office	396	263	66.4%
Miscellaneous	1,198	984	82.1%
Office	1,577	672	42.6%
Restaurant	296	202	68.2%
Retail Store	2,675	1,685	63.0%
Totals	8,297	5,804	70.0%

Table 2-6 shows the retention rates by business type for CFLs that were installed at the 142 sites. About two-thirds of the CFLs were installed at hotels, for which the retention rate was 35.5%. Survey respondents cited theft as a major reason for low lamp retention rates at hotels.

Table 2-6. Retention Rates by Business Type for CFLs: All Sample Sites

<i>Business Type</i>	<i>Number of CFLs Installed</i>	<i>Number of CFLs Retained and In Use</i>	<i>Percentage of CFLs Retained and In Use</i>
Church	513	284	55.4%
Food/Liquor	15	10	66.7%
Hotel	3,377	1,199	35.5%
Medical Office	102	21	20.6%
Miscellaneous	226	128	56.6%
Office	85	17	20.0%
Restaurant	220	102	46.4%
Retail Store	470	143	30.4%
Totals	5,008	1,904	38.0%

2.2.2 Retention Rates for Sites for Which Data Collection Was Completed

This section provides the results of an analysis of measure retention rates that was made using data only for the 129 sites for which data collection could be completed.

2.2.2.1 Retention Rates by Type of Measure: Sites for Which Data Collection Was Completed

Table 2-7 shows the retention rates for T-8 fixtures that were installed to replace T-12 fixtures at the 129 sites for which verification work could be completed. In the aggregate, the T-8 fixtures installed to replace T-12 fixtures for the set of 129 sample sites had a retention rate of 86.0%.

Table 2-8 shows the retention rates for CFLs that were installed to replace incandescent lamps. For the set of 129 sample sites for which verification data were collected, the CFLs installed to replace incandescent lamps had a retention rate of 40.3%.

Table 2-9 shows the retention rates for several other lighting measures that were installed at the set of 129 sample sites for which data were collected.

Table 2-7. Retention Rates by Type of Measure for T8 Fixtures Installed at 129 Sample Sites for Which Survey Data Were Collected

<i>Type of Measure</i>	<i>Number of Fixtures Installed</i>	<i>Number of Fixtures Retained and In Use</i>	<i>Percentage of Fixtures Retained and In Use</i>
1 Lamp T-8	123	104	84.1%
2 Delamp 4 ft. T-8	356	130	36.4%
2 Delamp T-8	4,384	3,935	89.8%
2 Lamp 4 ft. T-8	4	4	100.0%
2 Lamp T-8	1,022	929	90.9%
3 Delamp T-8	48	28	58.3%
3 Lamp T-8	23	22	95.7%
4 Delamp 4 ft. T-8	150	134	89.3%
4 Lamp 4 ft. T-8	440	373	84.8%
4 Lamp T-8	196	147	75.0%
Totals	6,746	5,804	86.0%

Table 2-8. Retention Rates by Type of CFL for CFLs Installed at 129 Sample Sites for Which Survey Data Were Collected

<i>Type of CFL</i>	<i>Number of CFLs Installed</i>	<i>Number of CFLs Retained and In Use</i>	<i>Percentage of CFLs Retained and In Use</i>
40 – 59W Screw-in Non-Reflector	235	127	54.0%
40 – 59W Screw-in Reflector	160	18	11.3%
60 – 75W Hardwired	12	8	66.7%
60 – 75W Screw-in Non-Reflector	868	511	58.9%
60 – 75W Screw-in Reflector	1,147	152	13.3%
76 – 100W Hardwired	9	9	100.0%
76 – 100W Screw-in Non-Reflector	1,566	870	55.6%
76 – 100W Screw-in Reflector	724	209	28.9%
Totals	4,721	1,904	40.3%

Table 2-9. Retention Rates for Other Measures for 129 Sample Sites for Which Survey Data Were Collected

<i>Type of Measure</i>	<i>Number of Measures Installed</i>	<i>Number of Measures Retained and In Use</i>	<i>Percentage of Measures Retained and In Use</i>
Incandescent Exit Sign LED Kit	204	192	94.1%
Occupancy Sensor Ceiling Mount	4	4	100.0%
Occupancy Sensor Wall Switch	28	23	82.1%
Other Fixtures, Drum or Strip	296	293	99.0%
Other Fixtures, Wrap or Troffer	145	142	97.9%

2.2.2.2 Retention Rates by Type of Business: Sites for Which Data Collection Completed

Retention rates for T8 fixtures and for CFLs were also calculated by type of business for the set of 129 sites for which verification data were collected.

Table 2-10 shows the retention rates by business type for T-8 fixtures that were installed to replace T-12 fixtures at the 129 sites. Because there were Offices comprised a relatively large portion of closed sample sites.

Table 2-10. Retention Rates by Business Type for T8 Fixtures Installed at 129 Sample Sites for Which Data Were Collected

<i>Business Type</i>	<i>Number of Fixtures Installed</i>	<i>Number of Fixtures Retained and In Use</i>	<i>Percentage of Fixtures Retained and In Use</i>
Church	1,972	1,845	93.6%
Food/Liquor	139	110	79.1%
Hotel	44	44	100.0%
Medical Office	356	263	73.7%
Miscellaneous	1,051	984	93.6%
Office	773	672	86.9%
Restaurant	262	202	77.1%
Retail Store	2,149	1,685	78.4%
Totals	6,746	5,804	86.0%

Table 2-11 shows the retention rates for CFLs that were installed to replace incandescent lamps when calculated using data for the set of 129 sample sites for which verification data were collected. Retention results in Tables 2-6 and 2-11 are identical for hotels because no hotels were closed at the time of survey.

Table 2-11. Retention Rates by Business Type for CFLs Installed at 129 Sample Sites for Which Data Were Collected

<i>Business Type</i>	<i>Number of CFLs Installed</i>	<i>Number of CFLs Retained and In Use</i>	<i>Percentage of CFLs Retained and In Use</i>
Church	513	284	55.4%
Food/Liquor	15	10	66.7%
Hotel	3,377	1199	35.5%
Medical Office	102	21	20.6%
Miscellaneous	173	128	74.0%
Office	17	17	100.0%
Restaurant	220	102	46.4%
Retail Store	304	143	47.0%
Totals	4,721	1,904	40.3%

2.3 REPLACEMENT OF CFLs

For CFLs that had been replaced by a different type of lamp, field staff attempted to identify the type of replacement lamp. Table 2-12 identifies the number of CFLs that were replaced either by other CFLs or by incandescent lamps. Of removed CFLs that were replaced, 58% were replaced with other CFLs and 42% were replaced with incandescent lamps.

Table 2-12. Number of CFLs Replaced by Other Lighting Measures

<i>Type of Measure</i>	<i>Number Replaced by Compact Fluorescent</i>	<i>Number Replaced by Incandescent</i>
40 – 59 Screw-in Non-Reflector	50	33
40 – 59 Screw-in Reflector	87	55
60 – 75 Screw-in Non-Reflector	5	327
60 – 75 Screw-in Reflector	841	114
76 - 100 Screw-in Non-Reflector	158	450
76 - 100 Screw-in Reflector	362	94
Totals	1,503	1,073

2.4 COMPARISON TO RETENTION RATES FROM OTHER STUDIES

The retention rates obtained in this study are comparable to retention rates obtained in other, similar studies.

Over a nine-year period, ADM conducted a nonresidential measure retention study for Southern California Edison (SCE) in which data were collected to measure retention rates for various energy efficiency measures installed in nonresidential facilities through SCE programs. Included among the measures studied were T8 fixtures and compact fluorescent lamps installed in commercial facilities. Both four-year and nine-year measure retention rates were determined.

- For T-8 fixtures, the four-year retention rate was determined to be 84.3%. This compares with the present study's T-8 retention rate of 70% when closed sites are included in the sample, or 86% when such sites are excluded.
- For CFLs, the four-year retention rate was determined to be 43.6%. This compares with the present study's retention rate of 38% for CF lamps when closed sites are included in the sample and with a rate of 40.3% when these sites are excluded.

Five other studies in which retention rates were calculated for CF lamps and/or T-8 fixtures were also reviewed.

- All of these studies found relatively high retention rates for T-8 fixtures, with varying lengths of time since installation.
- Results for CFLs are not as consistent. For instance, a 2001 study by San Diego Gas & Electric found the 4-year retention rate for such measures to be 75%.

Table 2-13. Retention Rates across Measure Retention Study Reports

<i>Author</i>	<i>Publication Date</i>	<i>Years Since Installation</i>	<i>CFL Retention</i>	<i>T8 Fixture Retention</i>
SDGE	2001	4	75.0%	
PG & E	2001	6		88.0%
PG & E	2004	9		85.2%
Equipoise Consulting	2006	1.5	88.7%	99.6%
PG & E	2006	9		88.2%

As described earlier in this chapter, separate sets of estimates for the retention of lighting measures were calculated using two sets of data, one set including businesses that had closed and another where such businesses were not included. Review of measure persistence/retention of other utilities show that business turnover is generally taken into account in determining measure persistence (along with early retirement of installed equipment and other reasons measures might be removed or discontinued).

3. ANALYSIS OF MARKET POTENTIAL

This chapter presents and discusses the results of the market-related analysis of the commercial lighting efficiency program. The analysis is based on surveys with 78 respondents who answered questions during a site visit. Percentages are reported throughout. Estimated units are the project number of units in the population.

The market analysis addressed the following questions:

- What is the pattern of owning and leasing among small and medium commercial establishments?
- How do lease patterns influence willingness to upgrade lighting?
- Has the target audience had prior experience with upgrading lighting?
- How recent is that experience?
- When the target audience has upgraded lighting, to what did it upgrade?
- Does having previously upgraded lighting influence future intentions to upgrade?
- Relative to other investment opportunities, how does lighting rank?
- What methods do the target audiences use to evaluate energy efficiency lighting investments?
- What role does payback play?
- If target audiences are interested in upgrading, what methods are they willing to use to pay for the upgrades?
- Are there limits on the amount of money the target audience is willing to invest?
- Are the target audiences aware of the program?

3.1 SAMPLING PLAN FOR MARKET POTENTIAL STUDY

Extensive data on the characteristics of commercial buildings are available for the sample of 300 facilities that were surveyed in SMUD's service territory as part of the most recent Commercial Energy Use Survey. (ADM collected the data at these sites under a subcontract with Itron.) The CEUS sites are a statistically representative sample of small commercial premises in SMUD's service territory,

Small- or medium-size CEUS sites provide fair representation of the sectors that SMUD has targeted for the commercial lighting program. Accordingly, CEUS sites with kW demands under 300 kW were used to select the sample for the market potential study. Not all of the CEUS sites fall into the under 300 kW category. Table 3-1 shows the distribution of the 300 SMUD CEUS sample sites by type of commercial premise and by size class. Of the 300 CEUS sites, 174

(about 60%) were small- or medium-size, providing the sample frame for the market potential study. Of these sites, a sample of 78 sites was selected.

Table 3-1. Distribution of SMUD CEUS Sample by Type of Premise

<i>Type of Business</i>	<i>Size Class</i>				<i>Grand Total</i>
	<i>Census</i>	<i>Large</i>	<i>Medium</i>	<i>Small</i>	
1. Small Office		35	21	5	61
2. Large Office	2	14	7	12	35
3. Restaurant		4	7	4	15
4. Retail Store		14	24	8	46
5. Food/Liquor		7	7	5	19
6. Unrefrigerated warehouse		6	9	4	19
7. School		4	5	6	15
8. College	1	2	2	2	7
9. Health Care	3	5	4	5	17
10. Hotel		2	3	2	7
11. Misc		27	24	4	55
25. Refrigerated warehouse		1	2	2	5
Grand Total	6	121	115	59	301

The market potential study was performed to develop improved estimates of the potential for a commercial lighting program, specifically for commercial customers with demand under 300 kW. Data were collected on-site for a sample of customer facilities from major sectors of the under 300 kW market segment. Table 3-2 shows the top ten sectors considered, as measured by kWh usage. The sample of 78 sites was drawn from facilities not yet participating in the program.

Table 3-2. Top Ten Sectors for Under 300 kW Customers

<i>Sector</i>	<i>Number Of Customers</i>	<i>Number Of Accounts</i>
Real Estate	160	2,356
Eating And Drinking Places	92	282
Automotive Dealers & Service Stations	57	228
Membership Organizations	43	304
Health Services	37	86
Miscellaneous Retail	30	160
Hotels And Other Lodging Places	27	85
Social Services	26	146
Furniture And Home Furnishings Stores	27	116
Electric, Gas, And Sanitary Services	26	169

3.2 DATA COLLECTION INSTRUMENTS

Detailed data on the characteristics of the lighting systems are already available for the CEUS sites. For each of the 78 CEUS premises that included in the sample for the market potential study, the field staff completed a short survey questionnaire. The primary goal of this survey was to gather sufficient information with which to understand the threshold of incentives necessary to get respondents to increase the efficiency of the lighting in their facility.

The survey form addressed three basic issues:

- Characteristics of the occupants;
- Awareness and interest in the program; and
- Threshold for incentives.

The first two issues were designed to determine if the occupant of the space is likely to even want to participate in the program. The part of the survey concerning the threshold for incentives was designed to determine they type and amount incentives that might be most appropriate.

With respect to the characteristics of the occupants, the following items of information were collected:

- Is the occupant a tenant or an owner of the space?
- If the occupant is a tenant, does the tenant have permission to change the lighting?
- If the occupant is a tenant, how far into the future does the tenant's lease extend?
- Assuming the tenant can reach an agreement with the landlord, is the tenant likely to want to continue in this location.
- How long is the occupant likely to remain in this location?
- Does the occupant anticipate capital expenditures to remodel or refurbish or to change displays, cases, décor, etc.? If so, how soon?
- How satisfied is the occupant with the existing lighting?
- With respect to awareness and interest in the program, we collected the following items of information:
 - Is the respondent aware of the SMUD Lighting Program?
 - If yes, has the respondent considered participating in the program?
 - Has the respondent taken any steps to participate in the program such as seeking information or talking to a contractor about it?
 - If the respondent has considered or taken some steps, why did the respondent decide to discontinue pursuing the lighting?

- Does the respondent have any interest in upgrading lighting? If not, why not?

3.3 MARKET POTENTIAL ANALYSIS

This section provides the results from analyzing the survey data to determine market potential for improving the efficiency of lighting in commercial facilities.

3.3.1 Firmographics and Leased and Owned Space

As shown in Table 3-3, 61 percent of the respondents owned part or all of their facility while 39 percent had a rental or leasing arrangement.

Table 3-3. Owned or Leased Space

	Frequency	Percent
Own or occupy part or all of the facility	17,101	61
Rent or lease from someone else	11,098	39
Total	28,199	100
N=28,199		

Within the sample, there are striking differences in ownership by the type of business. Eighty-seven or more percent of places of worship, motels, distributors, managed properties, and industrial facilities tend to be owned properties. Sixty-eight percent of offices were owned. Ownership of health care, and retail establishments was slightly greater than 50 percent. More than two-thirds of grocery, automotive, service, restaurants and school establishments were leased.

Table 3-4. Owned or Leased Space by Business Category (Percentage)

	Own	Lease	Estimated Units
Places of worship	100	0	3,662
Motels	100	0	166
Distributors	100	0	10
Managed properties	95	5	4,033
Industrial	87	13	2,037
Offices	68	32	3,860
Health care	55	45	2,725
Retail	53	47	5,233
Grocery & convenience	33	67	374
Car rental, dealers, maintenance	17	83	1,302
Services	12	88	3,642
Restaurant	0	100	709
Schools	0	100	447
Estimated Units	17,102	11,098	28,200

For lease customers, the length of the lease ranges from one to two years to ten or more years. Forty percent of the respondents are in lease arrangements of five or more years. Those in the 5 – 9 year category all had five year leases. Twenty-nine percent of the respondents didn't provide a lease term, but based on their responses about renewing their lease, about 14 percent, half of them, have leases that exceed two years.

Table 3-5. Years in Lease

	<i>Percent</i>	<i>N</i>
1-2 years	17	1,866
3-4 years	14	1,598
5-9* years	22	2,472
10+ years	18	2,002
Don't know no answer	29	3,159
Total	100	11,098

* Within this category no customer had a lease between six and nine years.

Sixty percent of the lessees (Table 3-6) said that they have more than two years before it's time to renew their lease. The length of the leases varies by business category (Table 3-7). Those with the longest leases were managed properties. One hundred percent of offices had five-year leases, as did schools. A high percentage of retail establishments reported three to four and five-year leases, some reported one to two year leases, and almost a quarter of such establishments reported leases of ten or more years.

Table 3-6. Time until Lease Renewal Due

	<i>Percent</i>	<i>N</i>
2 years or less	31	3,471
Longer than two years	60	6,626
Don't know/ Not Sure	9	1,000
Total	100	11,098

Service establishments were split between those with one and two year leases and leases of ten or more years. Automotive establishments reported length of leases that distributed uniformly across the categories. Except for services and retail, the number of cases on which the estimates are based is small and should be interpreted with caution. Also, many respondents did not give a length of the lease.

Table 3-7. Length of Lease by Business Category

	1-2 years	3-4 years	5-9 years	10+ years	No Answer	Total	Estimated Count
Offices	0	0	100	0	0	100	1,221
Managed properties	0	0	0	100	0	100	215
Health care	0	0	0	0	100	100	1,221
Retail	9	56	10	24	1	100	2,480
Car rental, dealers, maintenance	20	20	20	20	20	100	1,075
Services	38	0	7	28	27	100	3,211
Industrial	80	0	0	20	0	100	268
Restaurant	0	0	0	0	100	100	709
Grocery & convenience	0	0	50	0	50	100	250
Schools			100			100	447
Estimated count	1,866	1,598	2,472	2,002	3,159		11,097
	17	14	23	18	28	100	

3.3.2 Potential for Lessees to Alter Space

Table 3-8 shows that commercial sector leases generally allow for alterations to premises. Alterations are typically completed before occupancy of the space. For example, when a property is rented, the owner typically pays for improvements to a certain level (expense stop) after which the tenant is responsible for the remainder of the cost. The tenant has to negotiate the expense stop with the owner and also for changes to the space beyond the original agreement. The tenant may also be responsible for restoring a space to its original condition at the conclusion of the lease.

The lease also specifies responsibility for maintenance and operations. In office structures the owner typically takes responsibility for these functions including payment for energy costs although this may not always be the case, for example, an office located in a strip mall. In retail space, the lessee may exert more control, essentially leasing the shell and assuming responsibility for everything including HVAC. In these instances the lessee may pay the energy costs. In leased office space, the layout is usually fixed after occupancy. A lessee can negotiate changes but likely will have to pay for them. Eighty-six percent of lease respondents in this sample reported that they could request that changes be made to the facility.

Table 3-8. Policy on Facility Changes

	Percent	Estimated Count
Yes, we can make changes w/o approval	5	555
Yes, we can request the owner change it	86	9,543
No, we can't make changes	3	355
We have some other arrangement	4	431
Don't know/Not Sure	2	215
Total	100	11,098

3.3.3 Experience with and the Potential for Installing Energy Efficient Lighting

Evaluations of energy efficiency programs often find that participants in programs are more likely than nonparticipants to have previously installed energy efficiency measures. Based on this, respondents were asked if they had previously installed energy efficient lighting. Responses are tabulated in Table 3-9. Overall, 40 percent of the respondents indicated that they had. However, having previously installed energy efficient lighting is closely associated with owning or leasing. Fifty-three percent of the owners said that they had previously installed energy efficient lighting measures compared to 19 percent of the lessees.

Table 3-9. Past Installation of Energy Efficient Lighting Measures

	Own	Lease	Estimated Units
Yes	53	19	11,121
No	47	81	17,078
Total	100	100	28199
Estimated Units	17,100	11,099	

Table 3-10 shows that lessees with longer leases were more likely to have completed an energy efficient upgrade than lessees with shorter leases. Nearly a third of the lessees with leases of ten or more years had previously installed energy efficient lighting. Almost thirty percent of those not reporting a lease term also reported having previously installed efficient lighting. Recall from earlier discussion that at least half of those not reporting a lease term probably have lease terms that exceed two years. Twelve percent of lessees with lease terms of one to two years reported having installed efficient lighting. (It can only be speculated as to whether this may reflect the installation of new lighting at the inception of the lease.) None of the firms reporting lease terms of three to four years reported having previously installed efficient lighting. Thus, the evidence primarily indicates that having installed efficient lighting is associated with lease terms that exceed four years.

Table 3-10. Previous Energy Efficient Lighting Projects Completed by Years in Lease Agreement (Percentage)

	<i>Yes</i>	<i>No</i>	<i>Total</i>	<i>Estimated Units</i>
1-2 years	12	89	100	1,866
3-4 years	0	100	100	1,598
5 years	10	90	100	2,472
10+ years	32	68	100	2,002
Don't know no answer	30	70	100	3,159
N	2,048	9,049	11,097	11,097

Table 3-11 shows data on whether or not energy efficient lighting had previously been installed is related to business category. One hundred percent of distributors and motels reported having previously installed efficient lighting. Slightly more than 65 percent of offices, places of worship, and grocery and convenience stores report having previously installed efficient lighting. About half of automotive establishments and restaurants and forty percent of managed properties reported having done the same thing. About a quarter of industrial retail and service establishments reported previously installing efficient lighting. Few health care establishments and no schools reported having installed energy efficient lighting.

At least one caveat is in order. For some business categories (e.g., distributors, motel, groceries and convenience stores, and restaurants) the number of establishments represented in the sample is small. Thus, the actual values may vary from the estimates that are presented.

Table 3-11. Previously Installed Energy Efficient Lighting by Business Category (Percentage)

	<i>Yes</i>	<i>No</i>	<i>Total</i>	<i>Estimated Units</i>
Distributors	100	0	100	10
Motels	100	0	100	166
Offices	68	32	100	3,860
Places of worship	67	33	100	3,662
Grocery and convenience	67	33	100	374
Car rentals, dealers, maintenance	50	50	100	1,302
Restaurant	50	50	100	710
Managed properties	40	60	100	4,033
Industrial	27	73	100	2,037
Retail	25	75	100	5,234
Services	24	76	100	3,642
Health Care	10	90	100	2,725
Schools	0	100	100	447
N	11,122	17,080	28,202	28,202

Those who had completed lighting projects were asked when those projects were completed. Of the seven owners that gave specific dates for the projects, three said that projects had been done within this year (2007), one was done in 2006, three projects were done two years ago (2005), and the remainder were done more than two years ago. Only one lessee gave a date (2006) for a prior lighting project.

Respondents that had installed efficient lighting were asked what was installed and allowed to provide multiple open-ended responses. These responses are tabulated in Table 3-12. T8s were the most commonly installed measure for both owners and lessees. Owners were more than twice as likely to have previously installed T8s than lessees. About one in six owners had installed CFLs while just three percent of lessees had done so. Of the other measures, none were installed in sufficient number to rise above three percent. In some cases the number of installations was less than a half of one percent.

Table 3-12. Types of Lighting Measures Previously Installed (Percentage)

Measure	Own	Lease	Estimated Units
T8s	29	13	6,393
CFL	17	3	3,198
Skylighting	0 ¹	0	28
High Bay Metal Halide	1	0	215
C100	0 ¹	0	53
T12s	0 ¹	3	383
Halogens	0 ¹	0	10
High Pressure Sodium	0 ¹	3	53
LED Exits	0 ¹	0	28
Total (N)	55	22	10,361
Total estimated units	8,028	9,050	28,199

¹ The actual response was less than 0.5 percent and therefore reported as zero

3.3.4 Respondents' Plans for the Future

Small and medium businesses have many demands on their resources. To gauge how these resources would be allocated, the respondents were presented with a broad list of investment opportunities, including energy efficient lighting, and asked if they had cash or capital of between \$2,000 and \$7,500 dollars, what their first, second or third choice would be for an investment. The idea was to see if lighting would be one of their choices and what priority they would give to it. A project between \$2,000 and \$7,500 is consistent with the cost of a lighting upgrade for a small or medium business.

Table 3-13 shows owners' and lessees' responses. The list is organized by the percent of owners' first choices. Owners' top two choices were to refurbish the interior and new signs and fixtures. Exterior improvements were next. Lessees' top choice was to provide a new product

or service (fourth in the list of owners choices) followed by refurbishing the interior and new signs and fixtures. Not surprisingly, lessees did not choose external improvements since those are likely out of their control with most of the advantage to the owner. Efficient lighting was eighth in the first choice list for owners and fourth in the list for lessees. One percent of owners and nine percent of lessees picked lighting as a first choice. The percentages increased when owners picked second or third choices. For the second pick, lighting ranked 3rd among owners (16 percent) and 4th among lessees (18 percent). For the third pick, lighting ranked second at 21 percent for owners and 3rd at 20 percent for lessees.

The point to be taken from this analysis is that compared with other options, lighting is not high on the priority list of owners and lessees. If owners and lessees were to do just one project with a value between \$2,500 and \$7,500, efficient lighting would only be a choice for four percent of all respondents most of whom would be lessees.

Table 3-13. First, Second, and Third Project Choices If \$2,000 to \$7,500 Available in the Next Year for Improvement Projects

	First Choice		Second Choice		Third Choice	
	Own	Lease	Own	Lease	Own	Lease
Refurbish interior	31	17	19	20	2	8
New signs and fixtures	17	21	24	12	12	25
Exterior improvements	14	0	7	2	9	0
Products or service	9	22	11	12	1	11
Don't Know/No Answer	8	0	0	0	16	10
Equipment	8	8	0	4	2	0
No projects chosen	7	4	1	0	0	17
Security	2	0	0	0	0	0
Efficient lighting upgrade	1	9	16	18	21	10
New more furniture	1	2	4	0	9	5
Solar	1	0	0	0	0	0
Advertising/Marketing	1	0	0	3	0	1
Add More Staff or Employee Benefits	0	8	2	19	22	8
New Cash Registers or Computers	0	6	3	2	8	5
Extend Hours of Operation	0	3	0	0	0	0
Relocate	0	2	0	0	0	0
Refrigeration, HVAC, VFD Cooling Towers	0	1	0	3	0	0
No Other Choice (beyond first)	0	0	15	6	0	0
Total	100	100	100	100	100	100
	N=28,200		N=28,199		N=25,032	

The respondents were asked if knowing that a lighting upgrade would reduce energy costs and pay for itself with two years would change their first, second or third ranking. The responses are tabulated in Table 3-14. About a third of the owners said that knowing that would change their

first ranking. That is significant. Just four percent of lessees said that that it would change their ranking. In fact, knowing the payback period would be two years would only change lessees’ second and third rankings by about 10 percent each. Also, lessees were much less willing to change their ranked projects than were owners. More than three quarters said that they would not change a ranking based on that information. One interpretation of these data is that owners may be persuaded with information about paybacks. Lessees are less swayed by such information. In at least some instances this may be because the owner pays the utility bill and therefore payback is of little interest to the tenant.

Table 3-14. Would Knowing the Lighting Upgrade Would Reduce Energy Costs and Pay for Itself Within Two Years Change the Ranking?

	<i>Own</i>	<i>Lease</i>	<i>Estimated Units</i>
Would change first ranking	30	4	5,655
Would change second ranking	15	11	3,672
Would change third ranking	10	10	2,818
Would not change ranking	45	76	16,054
Total percent	100	100	28,199
Estimated units	17,101	11,098	28,199

3.3.5 Energy Efficiency Lighting in the Future

Respondents were asked about their plans to install lighting in the future. Table 3-15 shows that overall about 21 percent of respondents said that they were planning to install lighting in the future. Owners (28 percent) were more likely to say that they were planning to do so than lessees (9 percent). Owners (22 percent) were also more likely to say that they didn’t know or did not give an answer than lessees. This may indicate that a percentage of owners may still consider lighting.

Table 3-15. Planning on Installing Lighting in the Future

	<i>Own</i>	<i>Lease</i>	<i>Estimated Units</i>
Yes	28	9	5,810
No	50	75	16,874
Don’t know/No Answer	22	16	5,515
Total percent	100	100	
Estimated Units	17,101	11,098	28,199

Table 3-16 shows that owners and lessees who previously installed energy efficient lighting are more likely to do so in the future than those who had not. Forty-seven percent of owners and 23 percent of the lessees are likely to install efficient lighting in the future compared to seven and six percent of those who had not. Owners who had previously installed efficient lighting are more likely to install efficient lighting than lessees who had installed efficient lighting. None of the lessees who had previously installed efficient lighting indicated a “don’t know / no answer

response” while 28 percent of the owners did. This is an indication that the lessees may have been more certain about their response than the owners. In summary, those who had previously installed efficient lighting are more inclined to do so than those who had not and owners of premises are more likely than lessees to be so inclined.

Table 3-16. Firms that Previously Installed Lighting Are Likelier than Other Firms To Do So Again

Plan to Install in the future	<u>Own</u>			<u>Lease</u>		
	<u>Previously Installed Lighting</u>			<u>Previously Installed Lighting</u>		
	Yes	No	Units	Yes	No	Units
Yes	47	7	4,788	23	6	998
No	26	78	8,551	76	74	8,324
No Answer / Don't know	28	15	3,762	0	20	1,775
N=	9,072	8,029	17,101	2,048	9,049	11,097

Table 3-17 shows the percentage of businesses by type that are planning to install energy efficient lighting in the future. More than 50 percent of the businesses in the health care, large office, food/liquor, hotel and restaurant categories indicated their intention to install efficient lighting. About a quarter of the miscellaneous and retail store categories indicated that they had plans to do so in the future, and a seventh of the small offices indicated that they would. Schools and colleges indicated that they would not. Less than a third of warehouses indicated that they would install efficient lighting. There was a fairly high percentage of “no answers” in the categories of restaurants, warehouses and small businesses. This may indicate that they haven’t thought about it or don’t know. It is also important to keep in mind that the sample sizes are small and the percentages have the potential to change with a larger sample.

Table 3-17. Future Plans to Install Energy Efficiency Lighting by Business Category (Percentage)

	Yes	No	No Answer	Total	Estimated Units
Distributors	100	0	0	100	10
Grocery and convenience	67	33	0	100	374
Restaurant	50	0	50	100	710
Motels	50	50	0	100	166
Offices	36	32	32	100	1,221
Places of worship	33	67	0	100	3,662
Car rentals, dealers, maintenance	33	67	0	100	1,302
Industrial	22	76	3	100	2,037
Services	18	82	4	100	10
Retail	14	82	4	100	5,233
Health care	5	51	45	100	2,725
Managed properties	3	36	61	100	4,033
Schools	0	100	0	100	447
Estimated units	5,812	16,873	5,516	2,8201	28,201

Because lessees represent somewhat of a special case, their responses were examined to see if planning to install energy efficiency lighting in the future was related to the length of the lease. These results are shown in Table 3-18. Keeping in mind that only a very small percentage of lessees said that they were anticipating installing energy efficient lighting in the future, none of the respondents who had leases of four years or less said that they planned to install efficient lighting. Twenty-two percent of those with five-year leases said that they planned to do so. None of those with leases of more than ten years indicated that they planned to do so. Among those with an unknown length of lease about 15 percent said that they were planning to do so. Thus, those with shorter leases are not planning to upgrade lighting. It is unclear why those with the longest leases are not planning to do efficient lighting upgrades but one possibility is that they perceive that there is not sufficient reason or that it is not to their advantage to open a discussion of lease terms with the owner.

Table 3-18. Planning to Install EE Lighting in the Future by Number of Years in Lease Agreement

	<i>Yes</i>	<i>No</i>	<i>No Answer</i>	<i>Total</i>	<i>Estimated Units</i>
1-2 years	0	100	0	100	1,866
3-4 years	0	100	0	100	1,598
5 years	22	78	0	100	2,472
10+ years	0	89	11	100	2,002
Unknown	15	35	50	100	3,159
Estimated units	1,034	8,273	1,790		11,097

Table 3-19 shows that those with less than two years in the lease are more likely to be planning a lighting upgrade than those with more than two years remaining in the lease. This appears to be somewhat of an anomaly. This may reflect tenants who anticipate upgrading lighting when they renew their lease.

Table 3-19. Planning to Install EE Lighting in the Future by Years Remaining in Current Lease

	<i>Yes</i>	<i>No</i>	<i>No Answer</i>	<i>Total</i>	<i>Estimated Units</i>
Two years or less	16	84	0	100	1,001
More than two years	7	71	22	100	3,472
Don't know/no answer	0	64	36	100	6,627
Estimated units	1,035	8,274	1,791		11,100

3.3.6 Factors Influencing Decision-making

Respondents were asked about various aspects of decision-making. When asked about the financial methods they used to evaluate investment decisions, several respondents replied by saying that there were criteria other than financial criteria that were involved. One replied that

decisions were not made on the basis of financial considerations but instead based on style. Another respondent said decisions are based on the energy savings and another customer said that it would depend on the rebates. One firm based their decision on the fact that they are a green company. Yet another said that decisions are made on an “as needed” basis. These responses are fair warning against assuming that decisions made by small and medium businesses are necessarily based in the financial details.

Respondents were asked what financial methods they used to evaluate investments in renovations, remodeling, and replacement. The responses are tabulated in Table 3-20. (Note that respondents could give more than one response.) The availability of cash was a basis for determination for the most owners and lessees. Return on investment (ROI) was the second most common response followed by first cost and payback. This is important because payback tends to be emphasized when talking to customers but these data suggest payback is the least used criteria. That doesn’t mean that they do not appreciate or understand payback, but it suggests that for many it is not central to their investment decisions.

Table 3-20. Financial Methods Used to Evaluate Renovations, Remodeling, and Replacement Investments

	<i>Own</i>		<i>Lease</i>	
	<i>Percent</i>	<i>Normalized Percent¹</i>	<i>Percent</i>	<i>Normalized Percent¹</i>
Availability of cash	77	37	50	37
First cost	42	21	29	21
Payback	27	13	16	12
ROI	55	27	40	30
Total	201	100	135	100
Estimated number of units	17,100		11,098	

*Multiresponse

A second point of note is that owners offered more responses than did lessees. If the percentages are normalized to the number of responses, the owners and lessees appear to use the methods in about the same proportion. This suggests that owners may analyze investment decisions using more tools.

Respondents were asked if they had a limit on the amount they were willing to spend on a lighting efficiency projects and if so, what the limit is. As shown in Table 3-21, more than half of the owners and lessees did not respond to this question possibly indicating that they were not willing to invest, they did not know what their limit was, or they were unwilling to say. Overall, owners have slightly higher limits than lessees. About eight percent of owners had a limit under \$1,000 with another 11 percent saying their limit was between \$1,000 and \$3,000. Eleven percent indicated limits above three thousand. For lessees the corresponding limits were 12 percent, seven percent, and six percent. About 10 percent of the owners and lessees indicated that they had no limit. These data suggest that 24 and 30 percent of these populations would be

willing to purchase efficient lighting spending a minimum of \$1,000. Approximately another ten percent would be willing to spend between \$100 and \$1,000.

Table 3-21. Limit on Amount of Money Willing to Pay for an Lighting Energy Efficient Improvement Project

	<i>Own</i>	<i>Lease</i>	
	<i>Percent</i>	<i>Percent</i>	
Depends		3	355
Has limit, but not sure what	3	7	1,257
\$100-\$999	8	12	2,779
\$1000-\$3000	11	7	2,672
\$3001-\$8,000	2	2	614
\$8,001-\$20,000	8	2	1,593
\$20,001-\$50000	1	2	396
No limit	9	11	2,758
Don't know/No Answer	58	54	15,777
Total	100	100	28,201
N= 28,199	17,101	11,100	2,820

Respondents were asked about what payback they require. As shown in Table 3-22, owners exhibit a much wider range of required paybacks than lessees. The most frequent response for owners (45 percent) and lessees (75 percent) was that they required a one to two year payback. One might predict that owners would tolerate longer paybacks but 24 percent of owners, three times the percent of lessees, say they want a payback of less than a year. At the same time about a sixth of owners said that they could tolerate paybacks of ten or more years but just two percent of the lessees reported that to be the case for them.

Table 3-22. Payback Required for an Energy Efficient Project to be Considered Cost Effective

	<i>Own</i>	<i>Lease</i>	<i>Estimated Units</i>
One to Two Years	45	75	15,932
Three to Five Years	16	16	4,601
Ten Years	15	2	2,784
No Answer	24	7	4,883
Total (N)	100	100	
Estimated units	17,102	11,098	28,200

Respondents were also asked about methods of financing investments in projects with values between \$2,000 and \$7,500. Respondents were allowed to choose from four options: cash flow, internal capital funds, a line of credit, or a loan from a bank or financial firm. The responses are tabulated in Table 3-23. Owners overwhelming chose either cash flow (58 percent) or internal funds (55 percent). Only four percent of owners said that they would use a line of credit. About

the same percentage (58 percent) of lessees said that they would use cash flow but less than 20 percent said that they would use internal funds. About 25 percent of the lessees said that they might use a line of credit or a loan from a bank. These data suggest that owners of small and medium firms will use cash flow or existing funds for improvements of this magnitude but that many lessees do not have or are not willing to use capital. Overall, fewer than eight percent would consider using a line of credit or a loan. This suggests that a loan program would be of little interest to most of these respondents.

Table 3-23. Method of Financing for Projects Costing Between \$2,000 and \$7,500

	<u>Own</u> Percent	<u>Lease</u> Percent	<u>Estimated</u> Units
Cash flow	55	58	15,851
Internal funds (i.e. Capital Budget)	55	18	11,445
Line of credit	4	13	2,013
Loan from bank or financial firm	0	13	1,556
Total	114	102	
N=28,199	17,101	11,098	28,299

*Multiresponse

Respondents were also asked about the impact of reducing electricity costs on their profits. Table 3-24 shows that just over half of the owners (54 percent) said that reducing electricity costs would have an impact on their profits. About 21 percent thought that this would be a large impact. Twenty-eight percent of lessees thought that reducing electricity costs would impact their profits but only five percent thought the impact would be large. Further, almost a quarter of the lessees did not answer this question. Emphasizing bottom line impacts might be helpful in motivating some owners but appears not to be a message to which lessees would respond.

Table 3-24. Positive Impact of Reducing Electricity Costs on Profits

	<u>Own</u>	<u>Lease</u>	<u>Estimated</u> Units
No Impact	8	13	2,787
Very Little Impact	35	37	10,077
Some Impact	33	23	8,092
Large Impact	21	5	4,171
Don't know/No Answer	4	22	3,073
Total	100	100	
Estimated units	17,102	11,098	28,200

As shown in Table 3-25, about half of the owners and a third of the lessees said they knew about the SMUD Energy Efficiency Incentive Program for commercial customers program. There are clearly many small and medium businesses that do not. This may be a communication issue that SMUD can address, but it may also be related to perceptions and the perceived salience of the program for customers. Customers may have come into contact with information about the

program but may not remember because they do not perceive it to be relevant. This may be particularly true of lessees who because of the length of the lease or having to deal with a landlord may be inclined to ignore it. Further, as just noted, lessees are less likely to see reduced electric costs as contributing to their bottom line.

Table 3-25. Awareness of the SMUD Energy Efficiency Incentive Program for Commercial Customers

	<i>Own</i>		<i>Lease</i>	
	<i>Estimated Units</i>	<i>Percent</i>	<i>Estimated Units</i>	<i>Percent</i>
Yes	8,800	51	3,756	34
No	8,300	49	7,127	64
Don't Know/No Answer	0	0	215	2
Total		100		100
Estimated units	17,100		11,098	

Evidence from the study suggests that SMUD can influence customers to do lighting upgrades. Table 3-26 shows that approximately five percent of the respondents said that they definitely would do a project if SMUD assured them that new lighting would pay for itself within two years. More importantly, nearly two-thirds of the owners and more than a third of the lessees said that they “would probably” do the project with such assurances. This suggests that assurances may be an effective marketing strategy.

Table 3-26. Likelihood of Participation if Assured by SMUD that New Lighting Would Pay for itself within Two Years

	<i>Own</i>	<i>Lease</i>	<i>Estimated Units</i>
Definitely would do a project	8	4	1,677
Probably would do a project	67	37	14,816
Probably would NOT do a project	8	20	3,540
Definitely would NOT do a project	7	13	2,614
Don't Know/No Answer	15	26	4,333
Total	100	100	
Estimated units	15,881	11,099	26,980

Table 3-27 shows that the percentage of firms that would do a project with assurances was higher among those who have previously installed efficient lighting than those who had not done such a project. Thirty percent of the owners and nine percent of the lessees say that they would definitely do the project. Having previously completed a project did not seem to make a difference in the percentage of owners who said that they would “probably do a project” but it did have some influence with lessees.

Table 3-27. Percentage of Likely Participation with Assurances from SMUD that New Lighting Would Pay for Itself within Two Years among Those that Previously Installed Energy Efficient Lighting

	<i>Previously Installed Lighting</i>			
	<i>Own</i>		<i>Lease</i>	
	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>No</i>
Definitely would do a project	30	0	9	4
Probably would do a project	57	58	55	36
Probably would NOT do a project	3	17	0	20
Definitely would NOT do a project	3	8	0	16
Don't Know/No Answer	6	17	36	24
Total	100	100	100	100

This suggests that a possible strategy to attract customers is to guarantee the savings. SMUD could guarantee the difference between actual cost savings and the cost of a lighting upgrade. This would require some bookkeeping and would potentially involve measurement issues but these could be addressed. This might be a lower cost alternative to the use of incentives. The effectiveness would have to be evaluated. The guarantee would have some monitoring costs associated with it that might outweigh the costs of an incentive.

3.4 SUMMARY AND FINDINGS

The key findings from this analysis of the market potential for commercial lighting programs are as follows:

- About 60 percent of the buildings in the sample were owned and the rest were leased.
- Places of worship, motels, distributors, managed properties, industrial, and offices tended to be owned. Grocery and convenience stores, automotive establishments, service establishment, restaurants, schools tend to be leased
- Sixty percent of lessees had leases with a term of three years or more and 40 percent had leases with terms of five or more years. At least theoretically, this should allow time for payback on lighting investments.
- Sixty percent of lessees had more than two years left in their lease.
- If the typical payback on a lighting upgrade were two years, then 50 to 60 percent of lease customers would be able to recover the costs of a lighting upgrade before their lease expires. In actuality, a somewhat smaller number would consider upgrading because they would prefer an investment timeframe of more than two years to gain advantage from their investment.
- Eight-five percent of lessees can negotiate with the landlord to upgrade lighting systems. Depending on who pays the electric bill, the upgrade could reduce energy costs to the landlord or the tenant. In many instances the tenant may need to convince the landlord to upgrade the lighting because the landlord pays the bill.

- Overall, forty percent of the respondents had had experience with efficient lighting. Fifty three percent of owners and 19 percent of lessees had previous experience with installing efficient lighting.
- Distributors, motels, offices, places of worship, and grocery and convenience establishments had the highest percentage of firms with prior experience with efficient lighting.
- Most of the lessees who had experience with efficient lighting had occupied their space for three or more years.
- Those who had experience with efficient lighting had installed T8s and CFLs. There was little experience with other technologies including exit signs.
- Respondents were asked about different kinds of investments typical of small and medium sized businesses from \$2,000 to \$7,500. Overall, lighting was the first choice of only four percent of respondents. The first choice of owners was refurbishing the interior and signage. The first choice of lessees was products and services and signage. Lighting is a low priority for most owners or lessees.
- If owners knew that the payback for lighting was two years, then 30 percent would make that their first choice. Knowledge that an upgrade has a two-year payback did not influence lessees.
- About a quarter of owners and nine percent of lessees plan to upgrade in the future. Those who had previously upgraded lighting are most likely to say that they would do so again.
- Distributors, grocery and convenience, restaurant, and motels are the most likely to upgrade lighting in the future.
- When asked the basis for decisions about upgrading lighting, the availability of cash was the most common criterion, followed by return on investment, and first cost. Payback was the least often mentioned. This is important because efficiency programs tend to emphasize payback, the least considered criterion.
- Only 40 percent were willing to provide a limit on what they would be willing to pay for a lighting upgrade. The preponderance of these respondents who provided a limit was willing to pay a \$1,000 or more. These may also be respondents who were willing to consider an upgrade.
- About half of the owners and less than half of the lessees were aware of SMUD's commercial lighting program. Thus, there is a lack of awareness among a large number of potential program participants. This lack of awareness may represent a failure to communicate on SMUD's part but it may also represent the lack of salience of energy efficiency and lighting for owners and lessees.
- A key finding is that 69 percent of the owners and 41 percent of the lessees would probably do a lighting upgrade project if assured by SMUD that a lighting upgrade would payback in two years. Such a guarantee might be an alternative or a complement to incentive programs.

- Overall, this study suggests that lighting upgrades are not high on the priority list of small and medium businesses. Even so, there is a core of these businesses that plan to upgrade in the future. Key factors in the decision are the availability of cash and return on investment. Payback is not a strong motivational argument with small and medium businesses. Other studies have consistently shown that participants and potential participants in programs are wary of estimates of payback. This study suggests that if assured of a two-year payback, interest in the program would increase.
- Owners may be more easily convinced to participate than lessees. There are several reasons for this. Tenants may have limited timeframes for investment. Further, tenants may not always be responsible for the electric bill and therefore less interested in energy efficiency. Overall, the data seem to suggest that there is certain precariousness associated with a proportion of businesses that lease space. This may limit interest in investments in lighting and other efficient equipment.

4. PROCESS AND MARKET STUDY RESULTS

Under the program being evaluated, the District paid between 80% and 100% of the project cost for lighting efficiency retrofits. Because customers may have less commitment to the efficient lighting measures they receive at little or no cost, savings may be diminished as a result. A secondary issue relates to the potential ability for SMUD to serve more customers if participating customers provide a larger cost share. For both of these reasons, an assessment was made of the willingness by customers in the under 300 kW segment to invest in lighting efficiency improvements in which they contribute a larger portion of the cost, either through zero interest loans or shared savings arrangements. A process and market study using conjoint analysis was conducted to identify alternative program designs for a commercial lighting program in which participating customers contribute a greater portion of project cost. The results of that analysis are presented in this chapter.

4.1 DATA COLLECTION FOR CONJOINT ANALYSIS

The data with which to analyze customer preferences for alternative energy incentive options was collected during the same interviews used to collect the data for the market potential analysis. A conjoint ranking component was included as part of the on-site survey. That is, the field staff worked conjoint exercises with the respondents during the survey to collect information with which to determine the type and amount of incentives that might be most appropriate in order to facilitate participation in a commercial lighting program. Respondents were presented with pairs of alternative energy incentive options and asked to express preference for one of the options from each pair. To facilitate collection of the data during the conjoint exercises, the field staff used notebook computers that were programmed with the data collection form and with the conjoint materials. This allowed working with the customers more easily to collect the needed information.

A series of paired incentive options was presented to respondents in order to assess customer preferences for incentive options under which the customer bears varying shares of the up-front installation cost relative to customer preference for other specified incentive options. The energy incentive options used in forming the pairwise comparison that were presented to customers are shown in Table 4.1. With 7 options, there could be 21 combinations of options to compare. However, Options 1-4 incentivize new lighting installation with reduced monthly energy costs with the customer bearing varying shares of the up-front installation cost. The customer pays 100%, 75%, 50%, and 25% of installation costs under options 1, 2, 3, and 4, respectively. In practice, an option where the customer pays less always dominates an option where the customer pays more. Thus, 6 of the 21 combinations were excluded, leaving 15 combinations for respondents to make pairwise comparisons.

Table 4-1. Conjoint Ranking Energy Incentive Options

Option Number	Energy Incentive Option
1	Customer pays \$2,100 to install new lighting and customer’s monthly electric bill is immediately reduced by \$85.
2	Customer pays \$1,575 to install new lighting, SMUD pays \$525 and customer’s monthly electric bill is immediately reduced by \$85 per month.
3	Customer pays \$1,050 to install new lighting. SMUD pays \$1,050 and customer’s monthly electric bill is immediately reduced by \$85 per month.
4	Customer pays \$525 to install new lighting. SMUD pays \$1,575 and customer’s monthly electric bill is immediately reduced by \$85 per month.
5	SMUD gives customer a 24 month no interest loan for \$2,100 to install new lighting. Customer’s electric bill remains the same as it is now for 24 months and then drops by \$85 per month
6	SMUD gives customer a 48 month no interest loan for \$2,100 to install new lighting. Customer’s electric bill is immediately reduced by \$42.50 per month staying that way for 48 months after which it decreases by another \$42.50.
7	SMUD has a contractor install \$2,100 worth of lighting. Customer’s electric bill is \$85 less per month for 48 months but customer pays the contractor \$42.50 per month for 48 months.

4.2 PAIRWISE COMPARISONS FOR CONJOINT DATA

The preferences that respondents expressed for each pair of the 15 option pairs are reported in Table 4-2. Figure 4-1 shows graphically the changes in the percentages of respondents preferring the direct payment options 1-4 relative to each other and to the three different loan options 5-7. As expected, there is an inverse relationship between relative preference for customer-funded options and the percentage of costs borne by the customer.

Table 4-2. Energy Incentive Option Respondent Preferences
(Percentages reported based on n = 76)

Pair Number	Option 1	Option 2	Percent Prefer Option 1	Percent Prefer Option 2
1	1	5	48%	52%
2	2	5	56%	44%
3	3	5	71%	29%
4	4	5	80%	20%
5	1	6	41%	59%
6	2	6	53%	47%
7	3	6	73%	27%
8	4	6	74%	26%
9	1	7	51%	49%
10	2	7	70%	30%

Pair Number	Option 1	Option 2	Percent Prefer Option 1	Percent Prefer Option 2
11	3	7	75%	25%
12	4	7	91%	9%
13	5	7	67%	33%
14	5	6	42%	58%
15	6	7	69%	31%

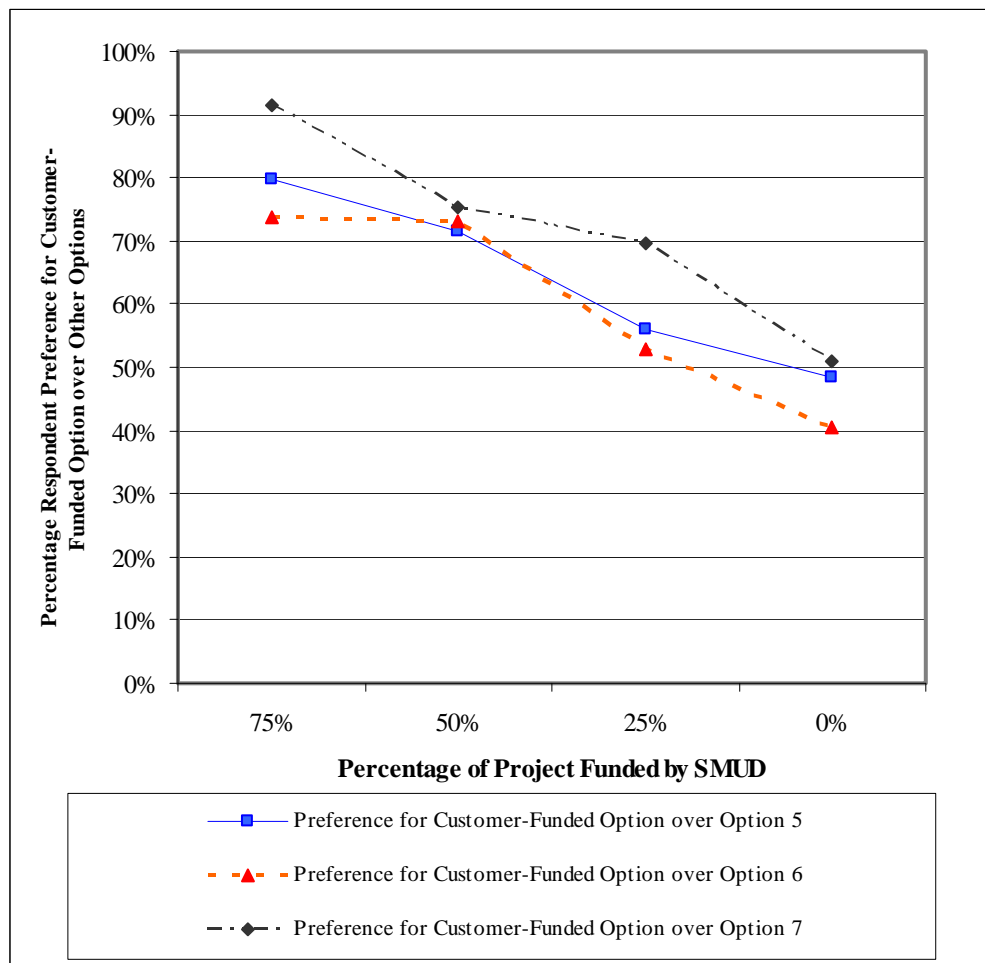


Figure 4-1. Respondent Preference for Customer-Funded Options over Loan Options

An OLS regression analysis was performed to calculate the elasticity of customer preference for an incentive with a customer share of up-front costs (similar to options 1-4 found in Table 4-1) in response to changes in SMUD funding share, relative to alternative options 5, 6 and 7. An increase in customer share of costs is expected to have the greatest negative impact on preference for a customer-funded program relative to option 7. An increase in customer share of costs is

expected to have the lowest negative impact on customer preference for a customer-funded program relative to preference loan option 5.

Table 4-3. Elasticity of Relative Preference for Incentive with Customer Share of Cost

<i>Change in Relative Demand for Customer-Funded Option in Response to a 10% Increase in Customer Share of Cost</i>	<i>Alternative Option</i>
-3.2%	5
-3.2%	6
-2.3%	7

These pairwise comparisons of program options imply the following preferences among customers.

- With the four direct payment options (i.e., Options 1-4), customers always prefer the option for which their direct payment is lower. For example, Option 2 is preferred over Option 1, Option 3 is preferred over Option 2, and Option 4 is preferred over Option 3.
- With the three loan options (i.e., Options 5-7), customers prefer Option 6 first, Option 5 second, and Option 7 third.
- In comparing direct payment options 1-4 against the preferred loan option (Option 6), customers strongly prefer direct payment Options 3 and 4 to the loan Option 6. However, customers split roughly evenly (53 percent to 46 percent) in favoring direct payment Option 2 over loan Option 6. Finally, customers strongly prefer Loan Option 6 over direct payment Option 1.

4.2.1 Results of Logistic Regression Analysis and Simulation

As part of the conjoint analysis, a logistic regression analysis (logit) was performed in order to estimate the utilities of the various factors determining customer preferences for different attributes of a lighting incentive program. In the context of conjoint analysis, utility is defined as a number that represents the value placed on an attribute. A low utility level indicates less value while a high utility level indicates greater value. The utility levels associated with specific characteristics may be summed in order to calculate the total utility level of a program with a set of such characteristics.

Table 4-4 presents the utility impacts of various program characteristics. The average utility impacts of each category of characteristics are also found in the table.

Table 4-4. Utility Values for Program Attributes
Derived from Logistic Regression Analysis

	Logit Run Total	Logit Run Stratum 1	Logit Run Stratum 2	
n =	75	44	31	
<u>Loan Term</u>				
0	53.46	53.87	-54.92	
24	3.21	-0.08	3.55	
48	-56.66	-53.78	51.37	
<u>Amount Customer Pays</u>				
\$0	31.33	29.00	-26.50	\$0
\$525	19.99	-0.96	12.02	\$1,050
\$1,050	28.57	-0.91	16.78	\$2,100
\$1,575	-33.53	-1.64	-8.94	\$3,150
\$2,040	-22.53	-24.75	26.06	\$4,080
\$2,100	-23.83	-0.73	-19.42	\$4,200
<u>Reduction in Bill</u>				
Nothing for 24 months, then decreases by \$85	3.61	-0.20	5.91	-170
\$42.50 for first 48 months, then decreases by another \$42.50	54.27	53.64	-50.21	-85
Decreases by \$85 immediately	-57.88	-53.44	44.31	-170
<u>SMUD Contractor Involved</u>				
Yes	56.43	65.76	-73.31	
No	-56.43	-65.76	73.31	
None	-416.18	-73.44	-31.56	
<i>Average Importance Ratings</i>				
Loan	27.53	26.91	26.57	
Amount Individual Pays	16.21	13.44	13.14	
Reduction in Bill	28.04	26.77	23.63	
SMUD Contractor Involved	28.22	32.88	36.65	

The logistic regression analysis was used to develop separate analyses of preferences for two subsets of customers. Stratum 1 includes customers with relatively lower levels of annual kWh usage, while Stratum 2 includes customers with relatively higher levels of annual kWh usage.

From the perspective of the smaller businesses in Stratum 1, the utility values for those respondents suggest that they prefer not to have a loan from SMUD, yet they also want to pay as little as possible for installation of energy efficient lighting. Saving on their electricity bill is important to them. The Stratum 1 respondents would definitely prefer to have a SMUD contractor install the lighting. They are less likely to say that none of the alternatives would be acceptable to them. In short, installing energy efficient lighting is not a priority for these customers--they don't want to have to pay for it, but at the same time they are not interested in "help" offered by SMUD, though when do they consider it, they want a SMUD contractor involved.

Stratum 2 respondents are larger businesses. These respondents are interested in a loan from SMUD, presumably because of the larger costs associated with installing energy efficient lighting and managing cash flow. They are interested in the immediate savings associated with the energy efficient lighting, though saving money on their electricity bill is not a major concern for them. They reject the idea of having a SMUD contractor involved in the installation. They are more likely to say that none of the alternatives would be acceptable to them. These respondents are more focused on cash flow issues and not having SMUD involved with the installation. They are also more amenable to energy efficient lighting programs as long as they can manage cash flow.

Simulations were developed in order to model likely customer responses to various program changes. For these simulations, a base program has been defined that has a relatively high direct payment to customers, similar to the provisions that SMUD earlier had in effect for the Prescriptive Lighting Program. For each change in customer share of cost, the percentage of customers likely to prefer the revised program is shown, along with the percentages of customers that would likely to prefer the base program with its relatively high direct payment or to select neither program option.

The results of the simulation analysis for Stratum 1 respondents is shown in Table 4-5. Having them pay for the energy efficient lighting is not at all appealing to them. Because they reject the loan and do not want a contractor involved, these features could not be manipulated in the simulations. (Note that removing the contractor was added to the Stratum 1 analyses after seeing the results from the Stratum 2 analysis; removing the contractor here has little effect on share of preference).

The results of the simulation analysis for Stratum 2 customers is shown in Table 4-6. Customers in Stratum 2 reject the base program. Adding a loan makes the program more palatable, but removing the SMUD contractor involved with the installation is by far the biggest incentive for enrolling in the program. Stratum 2 customers are not very price sensitive (as seen in the average importances found in Table 4-4) but are much more sensitive to the presence of a loan.

Based on the utility calculations and the simulations, it appears that customers in the different stratum would prefer different features in a lighting incentive program.

- Customers in Stratum 1 appear to prefer a program that is low-cost and without a loan, that requires minimal effort (i.e., uses SMUD contractors), and emphasizes the energy savings.
- Customers in Stratum 2 appear to prefer a program that includes a 48-month loan but gives immediate savings.

Table 4-5. Results of Simulation Analysis for Stratum 1

	<i>No Loan, Immediate Bill Reduction, Contractor Involved</i>	<i>No Contractor Only</i>
Base	100.00%	99.77%
None	0.00%	0.23%
Base	99.25%	98.92%
Customer Pays 25%	0.75%	0.75%
None	0.00%	0.34%
Base	99.24%	98.91%
Customer Pays 50%	0.76%	0.75%
None	0.00%	0.34%
Base	99.33%	99.00%
Customer Pays 75%	0.67%	0.67%
None	0.00%	0.34%
Base	99.22%	98.89%
Customer Pays 100%	0.78%	0.77%
None	0.00%	0.34%

Table 4-6. Results of Simulation Analysis for Stratum 2

	<i>No Loan, Immediate Bill Reduction, Contractor Involved</i>	<i>48-month loan added</i>
Base	26.64%	58.72%
None	73.36%	41.28%
Base	15.11%	9.36%
Customer Pays 25%	24.78%	60.15%
None	60.11%	30.49%
Base	14.87%	9.02%
Customer Pays 50%	25.94%	61.61%
None	59.19%	29.37%
Base	16.05%	10.91%
Customer Pays 75%	20.11%	53.56%
None	63.85%	35.53%
Base	16.46%	11.70%
Customer Pays 100%	18.03%	50.20%
None	65.51%	38.10%

APPENDIX A. TABLES WITH CEUS BUSINESS CATEGORIES

Table A-1. Own or Lease Space by CEUS Business Category (Percentage)

	<i>Own</i>	<i>Lease</i>	<i>N</i>
Small Office	79	33	17,088
Retail Store	9	14	3,114
Misc.	5	37	4,952
Food/Liquor	2	5	748
Health Care	2	0	383
Large Office	2	0*	282
Hotel	1	0	166
Non-refrigerated Warehouse	1	1	265
Restaurant	0	6	709
School	0	4	447
College	0*	0	15
Refrigerated Warehouse	0*	0	30
Total (N)	100 (17,100)	100 (11,099)	28,199

*At most, one customer within this business category

Table A-2. Lease Length by ADM Business Category

	<i>1 to 2 Years</i>	<i>3 to 4 Years</i>	<i>5 Years</i>	<i>10+ Years</i>	<i>No Answer</i>	<i>Total (N)</i>
Misc.	16	11	11	37	26	100 (4092)
Small Office	33	0	33	0	34	100 (3663)
Retail Store	0	75	0	25	0	100 (1557)
Restaurant	0	0	0	0	100	100 (709)
Food/Liquor	0	0	75	0	25	100 (499)
School	0	0	100	0	0	100 (447)
Non-refrigerated Warehouse	0	0	0	100	0	100 (106)
Large Office	0	0	0	0	100	100 (28)
N	1867	1599	2473	2002	3160	11101

Table A-3. Previously Installed EE Lighting by CEUS Business Category (percent)

	<i>Yes</i>	<i>No</i>	<i>Total</i>	<i>Total Estimated Units</i>
Health Care	100	0	100	383
Hotel	100	0	100	166
Large Office	100	0	100	282
Refrigerated Warehouse	67	33	100	30
Non-refrigerated Warehouse	60	40	100	265
Food/Liquor	50	50	100	748
Restaurant	50	50	100	710
Retail Store	50	50	100	3,114
Small Office	36	64	100	17,088
Misc.	35	65	100	4,952
College	0	100	100	15
School	0	100	100	447
Total estimated units	11,121	17,079	28,200	28,200

Table A-4. Future Plans to Install EE Lighting by the CEUS Business Category (Percentage)

	<i>Yes</i>	<i>No</i>	<i>No Answer</i>	<i>Total</i>	<i>N</i>
Health Care	67	33	0	100	383
Large Office	60	40	0	100	282
Food/Liquor	50	50	0	100	748
Hotel	50	50	0	100	166
Restaurant	50	0	50	100	710
Refrigerated	33	33	33	100	30
Warehouse					
Misc.	26	70	4	100	4,952
Retail Store	25	75	0	100	3,115
Non-refrigerated	20	60	20	100	265
Warehouse					
Small Office	14	57	29	100	17,088
College	0	100	0	100	15
School	0	100	0	100	447
N	5811	16,875	5515	28,201	28,201

APPENDIX B. DATA COLLECTION FORMS

The types of survey instruments used for the evaluation of the Prescriptive Lighting Program include:

- Retention Study Analysis Data Collection Form
- Market Survey Questionnaire

Copies of these survey instruments are included in this appendix.

SMUD

Prescriptive Lighting Program Retention Study

Retention Analysis Data Collection Form

Final Version: 1/25/07

Before interviewing customer, review SMUD project data to identify lighting conservation measures for that customer's facility, their number, where they are located, and in which building.

Customer Name: _____

Position: _____

Company _____

Phone () _____

Once the contact has been made, start:

I am _____, here on behalf of SMUD. In 2001 or 2002, lighting conservation measures were installed in your facility under SMUD's commercial lighting program. We would like to check on the measures that were installed and for which you received rebates from SMUD. We are conducting this follow-up survey to see how long lighting energy conservation measures are effective, and we are grateful for your cooperation. This update should take only a few minutes.

SECTION ONE - CHANGES IN OCCUPANCY & RENOVATIONS

I would like to start with some questions about changes in operations at your facility since 2002.

1. How long has this business been in operation at this facility? _____ Number of Years

2. Has there been any change in tenants at this facility since January 1, 2003?

No GO TO Question 2.

Yes



When did the change in tenancy occur? _____ (Specify Date by Month and Year)

3. Have there been any major renovations to the facility since January 1, 2003?

No GO TO Question 3.

Yes



What was the nature of the renovations?

Space was added _____ Square Feet Added

Space was reduced _____ Square Feet Reduced

Space was converted to different use

Other (Please Specify) _____



When did the renovations occur? _____ (Specify Date by Month and Year)



What percentage of the facility's floor space was affected by the renovations? _____%

4. Have there been any major changes to the facility's lighting equipment since January 1, 2003?

No GO TO Question 4.

Yes (Answer all that apply.)



What was the nature of the change in lighting equipment?

New equipment was installed

What was the new equipment? _____

Quantity of new equipment, if available: _____

Was the new equipment energy efficient? Yes No

Equipment that had failed was replaced

What equipment was replaced? _____

Equipment was retrofitted before it failed

What equipment was retrofitted? _____

Equipment was removed

What equipment was removed? _____

Other (Please Specify) _____



When did the change in lighting equipment occur? __ (Specify Date by Month and Year)
Did you make the change in equipment because of your experience with the lighting equipment that was installed through SMUD's Prescriptive Lighting Program?

Yes No

5. Have the operating hours for this facility changed since January 1, 2003?

No *GO TO Section 2.*

Yes



When did the change in operating hours occur? _____ (Specify Date by Month and Year)



What are the hours of operation for the facility?

On week days? From _____ To _____

On weekends/holidays? From _____ To _____

SECTION TWO - CHANGES IN REBATED EQUIPMENT

T8 FIXTURES/LAMPS

(Complete a set of these questions for each area in which T8 fixtures/lamps were installed.

Use a page for each area in which T8 fixtures/lamps were installed and inspected.)

SMUD's records show that you received a rebate to install T8 fixtures/lamps in *(Specify Area)*.

T8-1. Have any major actions occurred at this facility that resulted in the T8 fixtures/lamps in *(Specify Area)* being removed or replaced? *(Check all mentioned. Prompt if necessary.)*

No *Go to T8-2.*

Yes



What actions were these?



Major renovations and maintenance

Other *(Specify: _____)*



What effect did the actions have on the T8 fixtures/lamps?



T8 fixtures/lamps were removed and not replaced.



Why were the T8 fixtures/lamps removed and not replaced?

(Specify) _____



When were the T8 fixtures/lamps removed? _____ *(Specify Date by Month and Year)*

T8 fixtures/lamps were replaced with different type of lighting fixtures.



What were the T8 fixtures/lamps replaced with?

(Specify) _____



When were the T8 fixtures/lamps replaced? _____ *(Specify Date by Month and Year)*

T8 fixtures/lamps were relocated to another part of facility.

Number of fixtures with T8 lamps was decreased.

Number of fixtures with T8 lamps was increased.

Other *(Specify) _____*

T8-2. Approximately what percentage of the rebated T8 fixtures/lamps in *(Specify Area)* have been replaced since January 1, 2003 as a result of general maintenance? _____ %



Why did the T8 fixtures/lamps need replacing? *(Check all mentioned.)*

T8 lamps had burned out.

T8 fixtures had been damaged.

Other *(Specify) _____*

Electronic Ballasts

(Complete a set of these questions for each area in which electronic ballasts were installed. Use a page for each area in which electronic ballasts were installed and inspected.)

SMUD's records show that you received a rebate to install electronic ballasts in (Specify Area).

EB-1. Have any major actions occurred at this facility that resulted in the electronic ballasts in (Specify Area) being removed or replaced? (Check all mentioned. Prompt if necessary.)

- No Go to EB-2.
- Yes



What actions were these?



- Major renovations and maintenance
- Other (Specify: _____)



What effect did the actions have on the electronic ballasts?



- Electronic ballasts were removed and not replaced.



Why were the electronic ballasts removed and not replaced?

(Specify) _____



When were the electronic ballasts removed? _____ (Specify Date by Month and Year)

- Electronic ballasts were replaced with different type of lighting fixtures.



What were the electronic ballasts replaced with?

(Specify) _____



When were the electronic ballasts replaced? _____ (Specify Date by Month and Year)

- Electronic ballasts were relocated to another part of facility.
- Number of fixtures with electronic ballasts was decreased.
- Number of fixtures with electronic ballasts was increased.
- Other (Specify) _____

EB-2. Approximately what percentage of the rebated electronic ballasts in (Specify Area) have been replaced since January 1, 2003 as a result of general maintenance? _____ %



Why did the electronic ballasts need replacing? (Check all mentioned.)

- Electronic ballasts had burned out.
- Electronic ballasts had been damaged.
- Other (Specify) _____

Compact Fluorescents

(Complete a set of these questions for each area in which compact fluorescents were installed. Use a page for each area in which compact fluorescents were installed and inspected.)

SMUD’s records show that you received a rebate to install compact fluorescent lamps in *(Specify Area)*.

CF-1. Have any major actions occurred at this facility that resulted in the compact fluorescent fixtures/lamps in *(Specify Area)* being removed or replaced? *(Check all mentioned. Prompt if necessary.)*

No *Go to CF-2.*

Yes



What actions were these?



Major renovations and maintenance

Other *(Specify: _____)*



What effect did the actions have on the compact fluorescent fixtures/lamps?



Compact fluorescent fixtures/lamps were removed and not replaced.



Why were the compact fluorescent fixtures/lamps removed and not replaced?

(Specify) _____



When were the CFLs removed? _____ *(Specify Date by Month and Year)*

Compact fluorescent fixtures/lamps were replaced with different type of lighting fixtures.



What were the compact fluorescent fixtures/lamps replaced with?

(Specify) _____



When were the CFLs replaced? _____ *(Specify Date by Month and Year)*

Compact fluorescent fixtures/lamps were relocated to another part of facility.

Number of fixtures with compact fluorescent lamps was decreased.

Number of fixtures with compact fluorescent lamps was increased.

Other *(Specify) _____*

CF-2. Approximately what percentage of the rebated compact fluorescent fixtures/lamps in *(Specify Area)* have been replaced since January 1, 2003 as a result of general maintenance? %



Why did the compact fluorescent fixtures/lamps need replacing? *(Check all mentioned.)*

Compact fluorescent lamps had burned out.

Compact fluorescent fixtures had been damaged.

Other *(Specify) _____*

Delamping/Reflectors

(Complete a set of these questions for each area in which reflectors were installed.
Use a page for each area in which reflectors were installed and inspected.)

SMUD's records show that you received a rebate to delamp and install reflectors in (Specify Area).

R-1. Have any major actions occurred at this facility that resulted in the reflectors in (Specify Area) being removed or replaced? (Check all mentioned. Prompt if necessary.)

- No Go to R-2.
- Yes



What actions were these?



- Major renovations and maintenance
- Other (Specify: _____)



What effect did the actions have on the reflectors?



- Reflectors were removed and not replaced.



Why were the reflectors removed and not replaced?

(Specify) _____



When were the reflectors removed? _____ (Specify Date by Month and Year)

- Reflectors were replaced with different type of lighting equipment.



What were the reflectors replaced with?

(Specify) _____



When were the reflectors replaced? _____ (Specify Date by Month and Year)

- Reflectors were relocated to another part of facility.
- Number of fixtures with reflectors was decreased.
- Number of fixtures with reflectors was increased.
- Other (Specify) _____

R-2. Approximately what percentage of the rebated reflectors in (Specify Area) have been replaced since January 1, 2003 as a result of general maintenance? _____ %



Why did the reflectors need replacing? (Check all mentioned.)

- Reflectors had been damaged.
- Other (Specify) _____

Lighting Controls

(Complete a set of these questions for each area in which lighting controls were installed. Use a page for each area in which lighting controls were installed and inspected.)

SMUD's records show that you received a rebate to install lighting controls in *(Specify Area)*.

LC-1. Have any major actions occurred at this facility that resulted in the Lighting controls in *(Specify Area)* being removed or replaced? *(Check all mentioned. Prompt if necessary.)*

- No *Go to LC-2.*
- Yes



What actions were these?



- Major renovations and maintenance
- Other *(Specify: _____)*



What effect did the actions have on the lighting controls?



- Lighting controls were removed and not replaced.



Why were the lighting controls removed and not replaced?

(Specify) _____



When were the lighting controls removed? _____ *(Specify Date by Month and Year)*

- Lighting controls were replaced with different type of lighting fixtures.



What were the lighting controls replaced with?

(Specify) _____



When were the lighting controls replaced? _____ *(Specify Date by Month and Year)*

- Lighting controls were relocated to another part of facility.
- Number of fixtures with lighting controls was decreased.
- Number of fixtures with lighting controls was increased.
- Other *(Specify) _____*

LC-2. Approximately what percentage of the rebated lighting controls in *(Specify Area)* have been replaced since January 1, 2003 as a result of general maintenance? _____ %



Why did the lighting controls need replacing? *(Check all mentioned.)*

- Lighting controls had stopped working (e.g., because of damage).
- Lighting controls had been disconnected.
- Other *(Specify) _____*

LED Exit Signs

(Complete a set of these questions for each area in which LED exit signs were installed. Use a page for each area in which LED exit signs were installed and inspected.)

SMUD’s records show that you received a rebate to install LED exit signs in (Specify Area).

LED-1. Have any major actions occurred at this facility that resulted in the LED exit signs in (Specify Area) being removed or replaced? (Check all mentioned. Prompt if necessary.)

No Go to LED-2.

Yes



What actions were these?



Major renovations and maintenance

Other (Specify: _____)



What effect did the actions have on the LED exit signs?



LED exit signs were removed and not replaced.



Why were the LED exit signs removed and not replaced?

(Specify) _____



When were the LED exit signs removed? _____ (Specify Date by Month and Year)

LED exit signs were replaced with different type of lighting fixtures.



What were the LED exit signs replaced with?

(Specify) _____



When were the LED exit signs replaced? _____ (Specify Date by Month and Year)

LED exit signs were relocated to another part of facility.

Number of LED exit signs was decreased.

Number of LED exit signs was increased.

Other (Specify) _____

LED-2. Approximately what percentage of the rebated LED exit signs in (Specify Area) have been replaced since January 1, 2003 as a result of general maintenance? _____ %



Why did the LED exit signs need replacing? (Check all mentioned.)

LED exit signs had burned out.

LED exit signs had been damaged.

LED exit signs had been removed (e.g., because of other renovations).

Other (Specify) _____

Occupancy sensors

(Complete a set of these questions for each area in which occupancy sensors were installed. Use a page for each area in which occupancy sensors were installed and inspected.)

SMUD’s records show that you received a rebate to install occupancy sensors in (Specify Area).

OS-1. Have any major actions occurred at this facility that resulted in the occupancy sensors in (Specify Area) being removed or replaced? (Check all mentioned. Prompt if necessary.)

- No Go to OS-2.
- Yes



What actions were these?



- Major renovations and maintenance
- Other (Specify: _____)



What effect did the actions have on the occupancy sensors?



- Occupancy sensors were removed and not replaced.



Why were the occupancy sensors removed and not replaced?

(Specify) _____



When were the occupancy sensors removed? ____ (Specify Date by Month and Year)

- Occupancy sensors were replaced with different type of lighting fixtures.



What were the occupancy sensors replaced with?

(Specify) _____



When were the occupancy sensors replaced? ____ (Specify Date by Month and Year)

- Occupancy sensors were relocated to another part of facility.
- Number of fixtures with occupancy sensors was decreased.
- Number of fixtures with occupancy sensors was increased.
- Other (Specify) _____

OS-2. Approximately what percentage of the rebated occupancy sensors in (Specify Area) have been replaced since January 1, 2003 as a result of general maintenance? _____ %



Why did the occupancy sensors need replacing? (Check all mentioned.)

- Occupancy sensors had stopped working.
- Occupancy sensors had been damaged.
- Other (Specify) _____

SMUD

PRESCRIPTIVE LIGHTING PROGRAM

MARKET SURVEY QUESTIONNAIRE

Final Version, 4/05/2007

Version 1-A

4.2.1.1 ID No. _____

Customer Name: _____

Date of interview: _____

Date data entered _____

Hello, my name is _____. I am from ADM Associates, here on behalf of SMUD.

May I please speak to _____ (Contact Person)?

Title: _____ Company: _____

Address: _____ ZIP: _____

Phone: () _____

*Interviewer: If contact person is not available, schedule a callback.
If contact person is available:*

Hello, my name is _____. I am here on behalf of SMUD. Through its Commercial Prescriptive Lighting Program, SMUD has been working with lighting contractors to help commercial building owners improve the energy efficiency of the lighting systems in their facilities. SMUD would like to refine that program to better serve its customers. Accordingly, we would like to ask you some questions about what you think should be included in the program.

SCRN-Q.1 Many of our questions focus on your company's decisions to purchase and install energy efficient lighting equipment for your facility. Are you the best person to talk to?

- Yes. "I am the best person to talk to". *Continue interview at Question 1..*
- No. Is there someone else who would be better for us to contact?

Name: _____

Title: _____

Phone Number: _____

*(You are finished with this person. Start sheet for new contact person above)
Call this person and go to beginning of introduction.*

1. Do you own or lease this space?

- We own and occupy part or all of the facility. *(Go to question 2)*
- We rent or lease from someone else. *(Continue with question 1b)*

b. How many years is your lease or rental agreement for?

_____ years

c. When is your lease up for renewal?

- In two years or less
- Longer than two years

d. Does your lease/rental agreement allow you to make changes to the lighting?

- Yes, we can do it on our own with approval of the owner
- Yes, we can request that the owner do it
- No
- We have some other arrangement. *Describe*

2. Have you previously installed any energy efficient lighting at this facility?

- Yes

What did you install? _____

When was this installed? *(Month/Year)* _____

- No

3. Do you have any plans to install any energy efficiency lighting at this facility in the future?

- Yes

What do you plan to install? _____

When do you plan to have this equipment installed? _____

- No
- Don't Know/ No Answer

4. What method of financial analysis do you use to decide on remodeling / renovation / replacement investments for your business?

- Availability of cash
- First cost
- Payback period

- Return on investment
 Other *Describe:* _____
5. **What payback (*length of time*) do you normally require in order to consider an energy efficiency improvement project to be cost effective? ___ Years**
6. **If you were going to undertake a project that cost between \$2,000 and \$7,500, how would you most likely finance the project?**
 Would take it out of cash flow
 Would use other internal funds such as capital budget
 Would use line of credit
 Would take out loan specifically for the project from bank/other financial firm
 Would borrow for the project from some other source *What source?:* _____
 Other *Describe:* _____
7. **What impact would significantly reducing electricity costs have on increasing your profits?**
 Would have no impact on profits
 Would have very little impact
 Would have some impact
 Would have a large impact
 Don't know
8. **Suppose that your firm had between \$2,000 and \$7,500 available in the next year to undertake one or more business improvement projects. What projects would you do? Place a "1" before your first choice, a "2" before your second choice, and a "3" before your third choice.**
 ___ Refurbishing interior of premise
 ___ New signs
 ___ New or more fixtures
 ___ New or more furniture
 ___ Additional products or services
 ___ An efficient lighting upgrade
 ___ Add an employee benefit
 ___ Extend hours of operation
 ___ New cash registers or computers
 ___ Would not do any projects
 ___ Don't Know/ No Answer

9. If you knew that the efficient lighting upgrade would reduce your energy costs and pay for itself within two years, would you change your ranking and rank it first, second or third?

- First
- Second
- Third
- Would not change ranking

10. Do you have a limit on the amount of money that you would be willing to pay for a lighting energy efficiency improvement project?

- Yes, do have a limit
What is that limit? _____
- No, do not have a limit, will pay any amount that meets our required payback.
- Don't Know/ No Answer

11. Based on the experience that SMUD has had with companies like yours, the average cost of installing energy efficient lighting equipment is about \$2,100. The annual savings in electricity costs are about \$1,020. This means efficient lighting would pay for itself in about 2.1 years.

If SMUD assured you that you could install new lighting and that it would pay for itself in two years, how likely is it that you would do such a lighting project on your own (without assistance from SMUD)?

- Definitely would do project
- Probably would do project
- Probably would not do project
- Definitely would not do project
- Don't know

12. Are you aware that SMUD has an energy efficiency incentive program to help its commercial customers to improve energy efficiency of the lighting equipment at their facilities?

- Yes
- No
- Don't Know/ No Answer

13. I'm now going to read to you some alternatives (Table 1) for how SMUD could provide assistance to you to improve the energy efficiency of your lighting. For each pair of alternatives, tell me which alternative in the pair you most prefer. Your best guess is okay. If you would not choose either alternative in a pair, you can choose that as well.

Perform pairwise comparison of alternatives by asking questions on Page 7.

14. Do you have suggestions for other ways that SMUD could help you to definitely do a lighting energy efficiency improvement project?

Yes *Describe:* _____

No

Don't Know/ No Answer

That concludes the questions. Do you have any other comments that you would like to have relayed to SMUD about its programs for energy efficiency in commercial and industrial facilities?

Record any questions or concerns

Mr. Warren Lindeleaf is SMUD's project manager for this study. He can be contacted for further questions at 916-732-5489.

Thanks for your help!

***SMUD will use your ideas to improve its programs
for commercial and industrial customers.***

Table 1. Definitions of Alternatives: Stratum 1

1. You pay **\$2100** to install new lighting and your monthly electric bill is **immediately reduced** by \$85.
2. You pay **\$1,575** to install new lighting, SMUD pays \$525 and your monthly electric bill is immediately reduced by \$85 per month.
3. You pay **\$1,050** to install new lighting. SMUD pays \$1,050 and your monthly electric bill is immediately reduced by \$85 per month.
4. You pay **\$525** to install new lighting. SMUD pays \$1,575 and your monthly electric bill is **immediately reduced** by \$85 per month.
5. SMUD gives you a **24** month **no interest loan** for \$2100 to install new lighting. Your electric bill remains the same as it is now for **24 months and then drops** by \$85 per month
6. SMUD gives you a **48** month **no interest loan** for \$2100 to install new lighting. Your electric bill is **immediately reduced by \$42.50** per month staying that way for 48 months after which it decreases by **another \$42.50**.
7. SMUD has a contractor install \$2,100 worth of lighting. Your electric bill is **\$85 less** per month for 48 months but **you pay the contractor \$42.50 per month** for 48 months.

QUESTION 13
Stratum 1, Version A

602 Suppose Option 1 is: SMUD gives you a 48 month no interest loan for \$2,100 to install new lighting. Your electric bill is immediately reduced by \$42.50 per month staying that way for 48 months after which it decreases by another \$42.50.

Suppose Option 2 is: You pay \$1,575 to install new lighting, SMUD pays \$525 and your monthly electric bill is immediately reduced by \$85 per month.

Which option do you prefer? Or do you prefer neither?

- Option 1
- Option 2
- Neither
- Don't know
- No answer

103 Suppose Option 1 is: You pay \$2100 to install new lighting and your monthly electric bill is immediately reduced by \$85.

Suppose Option 2 is: You pay \$1,050 to install new lighting. SMUD pays \$1,050 and your monthly electric bill is immediately reduced by \$85 per month.

Which option do you prefer? Or do you prefer neither?

- Option 1
- Option 2
- Neither
- Don't know
- No answer

204 Suppose Option 1 is: You pay \$1,575 to install new lighting, SMUD pays \$525 and your monthly electric bill is immediately reduced by \$85 per month.

Suppose Option 2 is: You pay \$525 to install new lighting. SMUD pays \$1,575 and your monthly electric bill is immediately reduced by \$85 per month.

Which option do you prefer? Or do you prefer neither?

- Option 1
- Option 2
- Neither
- Don't know
- No answer

605 Suppose Option 1 is: SMUD gives you a 48 month no interest loan for \$2,100 to install new lighting. Your electric bill is immediately reduced by \$42.50 per month staying that way for 48 months after which it decreases by another \$42.50.

Suppose Option 2 is: SMUD gives you a 24 month no interest loan for \$2,100 to install new lighting. Your electric bill remains the same as it is now for 24 months and then drops by \$85 per month

Which option do you prefer? Or do you prefer neither?

- Option 1
- Option 2
- Neither
- Don't know
- No answer

207 Suppose Option 1 is: You pay \$1,575 to install new lighting, SMUD pays \$525 and your monthly electric bill is immediately reduced by \$85 per month.

Suppose Option 2 is: SMUD has a contractor install \$2,100 worth of lighting. Your electric bill is \$85 less per month for 48 months but you pay the contractor \$42.50 per month for 48 months.

Which option do you prefer? Or do you prefer neither?

- Option 1
- Option 2
- Neither
- Don't know
- No answer

501 Suppose Option 1 is: SMUD gives you a 24 month no interest loan for \$2,100 to install new lighting. Your electric bill remains the same as it is now for 24 months and then drops by \$85 per month

Suppose Option 2 is: You pay \$2100 to install new lighting and your monthly electric bill is immediately reduced by \$85.

Which option do you prefer? Or do you prefer neither?

- Option 1
- Option 2
- Neither
- Don't know

- No answer

504 Suppose Option 1 is: SMUD gives you a 24 month no interest loan for \$2,100 to install new lighting. Your electric bill remains the same as it is now for 24 months and then drops by \$85 per month

Suppose Option 2 is: You pay \$525 to install new lighting. SMUD pays \$1,575 and your monthly electric bill is immediately reduced by \$85 per month.

Which option do you prefer? Or do you prefer neither?

- Option 1
 Option 2
 Neither
 Don't know
 No answer

607 Suppose Option 1 is: SMUD gives you a 48 month no interest loan for \$2,100 to install new lighting. Your electric bill is immediately reduced by \$42.50 per month staying that way for 48 months after which it decreases by another \$42.50.

Suppose Option 2 is: SMUD has a contractor install \$2,100 worth of lighting. Your electric bill is \$85 less per month for 48 months but you pay the contractor \$42.50 per month for 48 months.

Which option do you prefer? Or do you prefer neither?

- Option 1
 Option 2
 Neither
 Don't know
 No answer

703 Suppose Option 1 is: SMUD has a contractor install \$2,100 worth of lighting. Your electric bill is \$85 less per month for 48 months but you pay the contractor \$42.50 per month for 48 months.

Suppose Option 2 is: You pay \$1,050 to install new lighting. SMUD pays \$1,050 and your monthly electric bill is immediately reduced by \$85 per month.

Which option do you prefer? Or do you prefer neither?

- Option 1
 Option 2

- Neither
- Don't know
- No answer

401 Suppose Option 1 is: You pay \$525 to install new lighting. SMUD pays \$1,575 and your monthly electric bill is immediately reduced by \$85 per month.

Suppose Option 2 is: You pay \$2100 to install new lighting and your monthly electric bill is immediately reduced by \$85.

Which option do you prefer? Or do you prefer neither?

- Option 1
- Option 2
- Neither
- Don't know
- No answer

102 Suppose Option 1 is: You pay \$2100 to install new lighting and your monthly electric bill is immediately reduced by \$85.

Suppose Option 2 is: You pay \$1,575 to install new lighting, SMUD pays \$525 and your monthly electric bill is immediately reduced by \$85 per month.

Which option do you prefer? Or do you prefer neither?

- Option 1
- Option 2
- Neither
- Don't know
- No answer

604 Suppose Option 1 is: SMUD gives you a 48 month no interest loan for \$2,100 to install new lighting. Your electric bill is immediately reduced by \$42.50 per month staying that way for 48 months after which it decreases by another \$42.50.

Suppose Option 2 is: You pay \$525 to install new lighting. SMUD pays \$1,575 and your monthly electric bill is immediately reduced by \$85 per month.

Which option do you prefer? Or do you prefer neither?

- Option 1
- Option 2
- Neither

- Don't know
- No answer

304 Suppose Option 1 is: You pay \$1,050 to install new lighting. SMUD pays \$1,050 and your monthly electric bill is immediately reduced by \$85 per month.

Suppose Option 2 is: You pay \$525 to install new lighting. SMUD pays \$1,575 and your monthly electric bill is immediately reduced by \$85 per month.

Which option do you prefer? Or do you prefer neither?

- Option 1
- Option 2
- Neither
- Don't know
- No answer

407 Suppose Option 1 is: You pay \$525 to install new lighting. SMUD pays \$1,575 and your monthly electric bill is immediately reduced by \$85 per month.

Suppose Option 2 is: SMUD has a contractor install \$2,100 worth of lighting. Your electric bill is \$85 less per month for 48 months but you pay the contractor \$42.50 per month for 48 months.

Which option do you prefer? Or do you prefer neither?

- Option 1
- Option 2
- Neither
- Don't know
- No answer

507 Suppose Option 1 is: SMUD gives you a 24 month no interest loan for \$2,100 to install new lighting. Your electric bill remains the same as it is now for 24 months and then drops by \$85 per month

Suppose Option 2 is: SMUD has a contractor install \$2,100 worth of lighting. Your electric bill is \$85 less per month for 48 months but you pay the contractor \$42.50 per month for 48 months.

Which option do you prefer? Or do you prefer neither?

- Option 1
- Option 2
- Neither

- Don't know
- No answer

701 Suppose Option 1 is: SMUD has a contractor install \$2,100 worth of lighting. Your electric bill is \$85 less per month for 48 months but you pay the contractor \$42.50 per month for 48 months.

Suppose Option 2 is: You pay \$2100 to install new lighting and your monthly electric bill is immediately reduced by \$85.

Which option do you prefer? Or do you prefer neither?

- Option 1
- Option 2
- Neither
- Don't know
- No answer

306 Suppose Option 1 is: You pay \$1,050 to install new lighting. SMUD pays \$1,050 and your monthly electric bill is immediately reduced by \$85 per month.

Suppose Option 2 is: SMUD gives you a 48 month no interest loan for \$2,100 to install new lighting. Your electric bill is immediately reduced by \$42.50 per month staying that way for 48 months after which it decreases by another \$42.50.

Which option do you prefer? Or do you prefer neither?

- Option 1
- Option 2
- Neither
- Don't know
- No answer

601 Suppose Option 1 is: SMUD gives you a 48 month no interest loan for \$2,100 to install new lighting. Your electric bill is immediately reduced by \$42.50 per month staying that way for 48 months after which it decreases by another \$42.50.

Suppose Option 2 is: You pay \$2100 to install new lighting and your monthly electric bill is immediately reduced by \$85.

Which option do you prefer? Or do you prefer neither?

- Option 1

- Option 2
- Neither
- Don't know
- No answer

502 Suppose Option 1 is: SMUD gives you a 24 month no interest loan for \$2,100 to install new lighting. Your electric bill remains the same as it is now for 24 months and then drops by \$85 per month

Suppose Option 2 is: You pay \$1,575 to install new lighting, SMUD pays \$525 and your monthly electric bill is immediately reduced by \$85 per month.

Which option do you prefer? Or do you prefer neither?

- Option 1
- Option 2
- Neither
- Don't know
- No answer

503 Suppose Option 1 is: SMUD gives you a 24 month no interest loan for \$2,100 to install new lighting. Your electric bill remains the same as it is now for 24 months and then drops by \$85 per month

Suppose Option 2 is: You pay \$1,050 to install new lighting. SMUD pays \$1,050 and your monthly electric bill is immediately reduced by \$85 per month.

Which option do you prefer? Or do you prefer neither?

- Option 1
- Option 2
- Neither
- Don't know
- No answer

203 Suppose Option 1 is: You pay \$1,575 to install new lighting, SMUD pays \$525 and your monthly electric bill is immediately reduced by \$85 per month.

Suppose Option 2 is: You pay \$1,050 to install new lighting. SMUD pays \$1,050 and your monthly electric bill is immediately reduced by \$85 per month.

Which option do you prefer? Or do you prefer neither?

- Option 1
- Option 2

- Neither
- Don't know
- No answer