IMPACT EVALUATION OF THE 2001 STATEWIDE LOW-INCOME ENERGY EFFICIENCY (LIEE) PROGRAM

Final Report

VOLUME 2

Study ID Number 577

Prepared for

Southern California Edison Company
Southern California Gas Company
San Diego Gas & Electric Company
Pacific Gas and Electric Company

Prepared by

KEMA-XENERGY Inc.
Oakland, California

and

Business Economic Analysis & Research
Lemon Grove, California

April 8, 2003

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EXECUTIVE SUMMARY

This report documents the impact evaluation of the statewide Low Income Energy Efficiency (LIEE) Program for Program Year (PY) 2001. The participating utilities are Southern California Edison Company (SCE), Pacific Gas and Electric Company (PG&E), San Diego Gas and Electric Company (SDGE), and Southern California Gas Company (SCG).

E.1 PROGRAM BACKGROUND

The LIEE program provides assistance to low-income customer groups throughout the state. The assistance includes installation of energy-efficiency measures, energy education, and repair and/or replacement of space heating and evaporative cooling equipment. The program serves an important equity objective in assisting customers who are highly unlikely or unable to participate in other residential conservation programs because of income constraints. This program allows income-eligible customers to receive the benefits of energy conservation without the hardship of making cash investments.

The utilities use a variety of community-based organizations (CBOs) and local private contractors for locating and recruiting households who qualify for program participation; i.e., households whose annual income is less than 175 percent of the Federal Poverty Guidelines (FPG) and 200 percent of the FPG for seniors and the disabled.[1] Staff from these entities are trained by each utility or utility representatives in the installation of ceiling insulation and other conservation measures.

Measures included in the standard LIEE program include:

- Evaporative cooler installation (permanent or portable)
- Relamping
- Weatherization
- Energy education
- Refrigerator replacement
- Porch lamp fixture replacement
- Furnace repair and replacement.

New LIEE measures instituted for Rapid Deployment in PY2001 include:

- Replacement of inefficient air conditioners with high-efficiency models (central systems and window/wall units)

[1] Low-Income Weatherization Income Limits established by the California Public Utilities Commission, Decision 01-06-010, dated June 7, 2001.

- Duct sealing and repair
- Whole-house fans
- Replacement of inefficient or inoperable water heaters with high-efficiency units
- Setback thermostats
- Evaporative cooler maintenance.

Also, renters are now eligible across all service territories to receive evaporative coolers, air conditioners, water heaters, refrigerators, and hard-wired lighting fixtures. (In the past, only home and/or appliance owners were eligible for these measures.)

E.2 EVALUATION OVERVIEW

Objective

The primary objective of the impact evaluation was to determine first-year gas and electric impacts resulting from the program.

Evaluation Approach

The impact evaluation utilizes a billing analysis approach. Monthly household electricity and natural gas consumption, both before and after program intervention, are modeled in regression equations as a function of program participation variables and other explanatory variables, such as weather and dwelling type. Engineering-based program savings variables were incorporated into the analysis for some measures to develop more detailed measure-specific results than could be obtained from a simple billing analysis. For the LIEE program, net savings are assumed to be equal to gross savings.

Data

Data used to support the evaluation came from a variety of sources, including:

- Program tracking system data for PY 2001 from each of the utilities
- Utility billing data—monthly electricity and natural gas use for the January 1999 to October 2001 period
- Weather data from multiple weather stations in each utility service area.

E.3 KEY FINDINGS

E.3.1 Total Program Impacts

Table E-1 provides a summary of PY2001 LIEE program impacts. Overall, the program is estimated to be saving 32.5 GWh per year and 1.7 Mth per year. SCE accounts for 58 percent of the statewide electric savings. PG&E accounts for 28 percent of the electric savings and 40

percent of the gas savings. SDG&E accounts for 14 percent of the electric savings and 17 percent of the gas savings. SCG accounts for 43 percent of the gas savings.

Table E-1
Summary of PY2001 LIEE Program Annual Impacts

Impact Category	Utility				Total
	PG&E	SCE	SCG	SDG&E	
Non-Weather-Sensitive kWh Impacts	7,484,499	16,942,327		4,502,875	28,929,700
Space Heating kWh Impacts	171,099	54,807		28,855	254,761
Space Cooling kWh Impacts	1,344,143	1,889,973		59,732	3,293,848
Total kWh Impacts	**8,999,741**	**18,887,106**		**4,591,462**	**32,478,309**
Non-Weather-Sensitive Therm Impacts	291,836		451,009	98,739	841,585
Space Heating Therm Impacts	388,884		289,398	183,882	862,164
Total Therm Impacts	**680,720**		**740,407**	**282,621**	**1,703,749**

Table E-2 summarizes PY2001 Program impacts by measure. As the table indicates, key electric measures are refrigerators, CFLs/porch lights, and evaporative coolers. Of note, 45 percent of the refrigerator savings (8.1 GWh) are associated with multifamily dwellings, which are predominantly occupied by renters. Program changes in PY2001 allowed qualified renters to receive replacement refrigerators, opening up the Program to new markets.

Table E-2
Program Impacts by Measure – Annual Impacts

Measure	kWh		Therms
	Heating and Other	Cooling	Heating and Other
CFL	9,011,942		
Porch Light	1,660,087		
Refrigerator	17,951,706		
Faucet Aerators	63,570		196,901
Low Flow Showerhead	176,977		475,940
Water Heater	13,452		56,582
Water Heater Blanket	30,959		95,452
Water Heater Pipe Wrap	21,007		16,710
Attic Insulation	31,166	94,071	147,970
Caulking	47,760	16,118	92,208
Duct Sealing	476	4,902	30,862
Minor Home Repair	98,935	49,471	234,811
Programmable Thermostat	136	804	842
Weatherstripping	65,432	10,536	149,381
Central AC		358,313	
Evaporative Cooler Installation		2,324,859	
Evaporative Cooler Maintenance		305,982	
Room AC		118,338	
Whole House Fan		10,454	
Evaporative Cooler Cover	763		9,295
Furnace Filters	10,094		31,865
Furnace Repair			51,143
Furnace Replacement			113,789

E.3.2 Per-Unit Measure Impacts

Per-unit measure savings for non-weather-sensitive measures are presented in Table E-3. Unit savings are expressed on a per-home basis, except for CFLs, which are expressed on a per-bulb basis. Measure savings vary by dwelling type. Non-weather-sensitive measure unit impacts are constant across utilities.

Table E-3
Annual Per-Unit Savings – Non-Weather-Sensitive Measures

Measure	Dwelling Type	kWh per Year	Therms per Year
Faucet Aerators	Multifamily	26.5	2.6
	Mobile Home	26.5	2.6
	Single Family	43.4	3.6
Low Flow Showerhead	Multifamily	66.6	7.2
	Mobile Home	66.6	7.2
	Single Family	108.7	8.2
Water Heater Replacement	Multifamily	118.0	9.5
	Mobile Home		19.0
	Single Family		19.0
Water Heater Blanket	Multifamily	88.5	9.2
	Mobile Home	88.5	9.2
	Single Family	145.3	11.3
Water Heater Pipe Wrap	Multifamily	35.4	3.6
	Mobile Home	35.4	3.6
	Single Family	58.1	4.6
CFL	Multifamily	16.4	
	Mobile Home	16.4	
	Single Family	23.7	
Porch Light	Multifamily	24.2	
	Mobile Home	24.2	
	Single Family	35.6	
Refrigerator	Multifamily	665.1	
	Mobile Home	665.1	
	Single Family	794.8	

Average per-unit savings for measures affecting weather-sensitive end uses are presented in Table E-4. These impacts, which vary by climate zone and utility, are summarized here. Unit impacts are also summarized by utility and climate zone elsewhere in the report. While impacts tend to be highest for single-family dwellings and lowest for multifamily dwellings, statewide average impacts by dwelling type are greatly influenced by the distribution of dwellings across the various climate zones in California.

Table E-4
Annual Per-Unit Savings – Weather-Sensitive Measures – kWh and Therms per Year

Measure	Dwelling Type	kWh		Therms
		Heating	Cooling	Heating
Attic Insulation	Multifamily	258.0	190.6	23.9
	Mobile Home			
	Single Family	274.7	206.1	33.8
Caulking	Multifamily	9.9	1.8	1.5
	Mobile Home	11.4	1.7	3.2
	Single Family	18.1	5.2	3.8
Central AC	Multifamily		565.9	
	Mobile Home		179.0	
	Single Family		240.1	
Duct Sealing	Multifamily	5.2	21.3	1.1
	Mobile Home		4.7	8.1
	Single Family	93.0	35.5	10.0
Evaporative Cooler Cover	Multifamily	5.9		0.7
	Mobile Home	6.1		2.0
	Single Family	9.5		2.8
Evaporative Cooler Installation	Multifamily		105.9	
	Mobile Home		353.7	
	Single Family		326.9	
Evaporative Cooler Maintenance	Multifamily		54.4	
	Mobile Home		94.4	
	Single Family		71.4	
Furnace Filters	Multifamily	11.0		1.4
	Mobile Home	12.7		2.0
	Single Family	17.7		3.8
Furnace Repair	Multifamily			30.1
	Mobile Home			28.0
	Single Family			30.8
Furnace Replacement	Multifamily			60.1
	Mobile Home			33.8
	Single Family			34.5
Minor Home Repair	Multifamily	22.8	11.2	2.4
	Mobile Home	26.2	10.3	4.5
	Single Family	42.7	15.3	6.2
Programmable Thermostat	Multifamily	1.0	16.4	1.8
	Mobile Home	18.5	9.8	1.2
	Single Family	19.5	8.4	2.7
Room AC	Multifamily		270.2	
	Mobile Home			
	Single Family			
Weatherstripping	Multifamily	14.1	1.8	1.6
	Mobile Home	18.8	1.8	3.2
	Single Family	18.2	5.1	3.2
Whole House Fan	Multifamily		90.5	
	Mobile Home			
	Single Family		108.5	

1 INTRODUCTION

This report presents the results of an impact evaluation conducted for the California Low Income Energy Efficiency (LIEE) program, covering program year (PY) 2001, as well as Rapid Deployment. The participating utilities are Southern California Edison Company (SCE), Pacific Gas and Electric Company (PG&E), San Diego Gas and Electric Company (SDG&E), and Southern California Gas Company (SCG). Southern California Edison Company (SCE) managed this project on behalf of all the California investor-owned utilities (IOUs).

1.1 BACKGROUND

Each of the four California IOUs—SCE, PG&E, SDG&E, and SCG—implemented the LIEE program during PY2001. In addition, the utilities were ordered by the California Public Utilities Commission (CPUC) to implement Rapid Deployment,[1] an effort intended to increase and expand the level of LIEE program services provided during 2001 in an attempt to help reduce the effects of the State's energy crisis on low-income residents. The State legislature authorized additional funding for the LIEE program, and with carryover funds from the previous LIEE program year, the utilities expanded their program offerings to low-income customers. Six new measures were added, and eligibility requirements were expanded for existing LIEE program measures.

In addition to this impact evaluation, KEMA-XENERGY has conducted a process evaluation for the PY2001 LIEE program and Rapid Deployment. The results of this evaluation have been reported in Volume 1 of the LIEE evaluation report.

KEMA-XENERGY also conducted a comprehensive process and impact evaluation of the LIEE program for PY2000.

1.2 PROGRAM DESCRIPTION

Since the early 1980s, California's investor-owned natural gas and electricity utilities have offered programs designed to support energy services to the low-income community. These programs have taken a number of forms. At this time, all four utilities administer both California Alternate Rates for Energy (CARE) and LIEE programs. The LIEE programs consist of weatherization, appliance repair or replacement, and energy education components.

The LIEE program provides assistance to low-income customer groups throughout the state. The assistance includes installation of energy-efficiency measures, energy education, and repair and/or replacement of space heating and evaporative cooling equipment. The program serves an important equity objective in assisting customers who are highly unlikely or unable to participate in other residential conservation programs because of income constraints. This program allows

[1] Decision 01-05-033.

income-eligible customers to receive the benefits of energy conservation without the hardship of making cash investments.

The utilities use a variety of community-based organizations and local private contractors for locating and recruiting households who qualify for program participation; i.e., households whose annual income is less than 175 percent of the Federal Poverty Guidelines (FPG) and 200 percent of the FPG for seniors and the disabled.[2] Staff from these entities are trained by each utility or utility representatives in the installation of ceiling insulation and other conservation measures.

Measures included in the standard LIEE program include:

- Evaporative cooler installation (permanent or portable)
- Relamping
- Weatherization
- Energy education
- Refrigerator replacement
- Porch lamp fixture replacement
- Furnace repair and replacement.

New LIEE measures instituted for Rapid Deployment in PY2001 include:

- Replacement of inefficient air conditioners with high-efficiency models (central systems and window/wall units)
- Duct sealing and repair
- Whole-house fans
- Replacement of inefficient or inoperable water heaters with high-efficiency units;
- Setback thermostats
- Evaporative cooler maintenance.

Also, renters are now eligible across all service territories to receive evaporative coolers, air conditioners, water heaters, refrigerators, and hard-wired lighting fixtures. (In the past, only home and/or appliance owners were eligible for these measures.)

A complete list of the PY2001 LIEE measures that are applicable for one or more of the utilities is provided in Table 1-1.

[2] Low-Income Weatherization Income Limits established by the California Public Utilities Commission, Decision 01-06-010, dated June 7, 2001.

Table 1-1
PY2001 LIEE Program Installed Measures

Attic access install	Duct sealing/repair	HWD lights	Turbine vents
Attic access weatherstrip	Eave/soffit vents	Low-flow showerheads	Utility gaskets
Attic insulation	Energy education	Miscellaneous (nails, tape)	Wall repairs
Attic venting	Evaporative cooler cover	Mobile home repairs	Water heater
MHR	Evaporative cooler	Pipe insulation	Water heater blankets
Caulking	Evaporative cooler maintenance	Plumbing repair	Weatherization
Central air conditioner	Exterior CFL fixtures	Refrigerator replacement	Weatherstrip
CFLs	Faucet aerators	Roof jack vents	Whole house fan
Cover plates replaced	Furnace filters	Setback thermostat	Window area repair
CVA	Furnace repair	Shower adapters	Window pane replacement
Doors repaired	Furnace replacement	Switch/outlet gaskets	Window repair
Doors replaced	Glass replacement	Thresholds installed	Window/wall air conditioner
Door weatherstrip	Glazing compound	Thresholds repaired	

1.3 EVALUATION OBJECTIVES

The impact evaluation is intended to quantify first-year load impacts by developing savings estimates for PY2001 installed measures based on a billing analysis. These savings estimates will be used to assess energy savings and update forecasting assumptions. In addition, the billing analysis of PY2001 installed measures is a formal part of the filing requirements of the PY2001 earnings assessment.

1.4 EVALUATION APPROACH

The impact evaluation utilizes a billing analysis approach. Monthly household electricity and natural gas consumption, both before and after program intervention, are modeled in regression equations as a function of program participation variables and other explanatory variables such as weather, dwelling type, and survey variables. Engineering-based program savings variables were incorporated into the analysis for some measures to develop more detailed measure-specific results than could be obtained from a simple billing analysis.

The billing analysis model used all individually metered PY2001 program participants with adequate billing data.

1.5 REPORT ORGANIZATION

The remainder of this report is organized as follows:

- Section 2, Methodology, provides a description of the research methods and data used in the study
- Section 3, Analysis and Results, presents the study findings and results
- Appendix A contains M&E Protocols Table 6 and Table 7
- Appendix B presents detailed impacts for each utility by climate zone and dwelling type
- Appendix C provides a listing of the weather stations and associated degree days for each weather station utilized in the study
- Appendix D is the Public Input Workshop Report.

2 METHODOLOGY

2.1 OVERVIEW

This section presents the study methodology. First, we present the data collection procedures, following by a description of the analysis approach.

A billing analysis approach was used to develop savings estimates for the LIEE program. Electric and gas regression models were developed and integrated to provide program impact results based on all individually metered program participants who had adequate billing data. Only very large usage customers (over 3,500 kWh per maximum month usage and 450 therms per maximum month usage) and very low electric usage customers (under 50 kWh per month) were excluded from the analysis.

2.2 DATA COLLECTION

This subsection outlines the data collection activities and data sources that were used for the project. A number of different data elements were used to support the billing analysis, including:

- Program tracking system data
- Utility billing data
- Weather data.

Sources for these data are discussed next.

2.2.1 Program Tracking System Data

The utilities each provided program tracking data for each of the their programs. These data included:

- Customer identification (name, address, phone number, account number, etc.)
- Measure installation dates
- Measure descriptions and quantities
- Customer demographics (age category, language type, income)
- Home and end-use information (home size, home type, presence of electric heating, electric water heating, and air conditioning).

All data were sufficiently documented and organized to facilitate incorporation into the analyses.

2.2.2 Billing Data

The utilities provided KEMA-XENERGY with billing data for the period of January 2000—September 2002. The data spanned a period sufficient to comply with the M&E Protocols.

Billing data consisted of kWh and therm consumption, electric and gas revenue amounts, meter read dates, and days in the billing period.

2.2.3 Weather Data

The utilities provided daily average temperature data for each available weather station for the period of October 2001—September 2002. Weather data were already available from the prior impact study for the January 1990—October 2001 period. These data combined covered the dates included in the billing histories and also provided a 10-year period to construct "average" temperature conditions for use in normalizing savings estimates. A mapping of each customer to the appropriate weather station also was provided.

Cooling degree-day and heating degree-day variables (both using a 65 °F base) were calculated on a daily basis. These variables were aggregated to each customer's billing month based on individual meter read dates.

Table 2-1 shows average daily cooling and heating degree days by utility and climate zone. The degree days vary by utility, end use, fuel type, and dwelling type as a function of the location of customers and measure installations within a climate zone. Appendix C lists the weather stations and associated degree days for each weather station utilized in the study.

Table 2-1
Average Cooling and Heating Degree Days by Utility and Climate Zone

Utility	CEC Climate Zone	Electric Cooling - CDD			Electric Heating - HDD			Gas Heating - HDD		
		Single Family	Multiple Family	Mobile Home	Single Family	Multiple Family	Mobile Home	Single Family	Multiple Family	Mobile Home
PG&E	1	0.02	0.02	0.02	11.0	11.0	10.5	11.0	11.0	11.0
PG&E	2	2.2	1.6	2.3	8.3	7.7	8.3	7.8	7.8	8.1
PG&E	3	1.1	0.8	2.0	6.8	6.5	6.2	6.6	6.7	6.2
PG&E	4	1.5	1.6	1.4	6.6	6.0	5.9	6.0	5.9	6.1
PG&E	5	1.5	2.0	-	7.1	6.9	-	7.1	6.9	-
PG&E	11	4.6	4.3	4.8	7.2	7.2	6.8	6.9	6.8	6.8
PG&E	12	4.0	3.7	4.2	7.8	6.6	6.9	6.3	6.3	5.6
PG&E	13	6.5	6.5	6.5	5.7	5.7	5.6	5.6	5.6	5.6
PG&E	16	4.0	2.7	4.0	8.4	9.4	8.1	6.7	6.6	6.6
SCE	6	1.6	1.5	1.4	4.2	4.3	4.8			
SCE	8	1.9	1.8	1.8	4.2	4.2	4.0			
SCE	9	2.6	2.5	1.9	4.5	4.5	4.5			
SCE	10	3.9	3.8	3.8	5.4	5.4	6.1			
SCE	13	4.8	4.8	4.8	7.2	7.2	7.2			
SCE	14	5.1	5.0	5.7	7.9	7.8	7.7			
SCE	15	10.8	10.8	10.8	3.0	2.9	2.9			
SCE	16	1.0	1.0	1.0	13.8	14.1	14.1			
SCG	4							6.0	6.2	6.5
SCG	5							4.1	4.1	4.1
SCG	6							3.9	4.1	2.8
SCG	8							2.6	2.8	2.6
SCG	9							3.2	2.9	3.3
SCG	10							3.5	3.4	3.6
SCG	13							6.5	6.5	6.5
SCG	14							6.5	6.5	6.5
SCG	15							2.5	2.6	2.3
SCG	16							5.2	3.9	10.9
SDG&E	7	2.3	2.2	1.7	3.8	3.8	3.8	3.8	3.8	3.8
SDG&E	10	3.0	3.1	3.1	4.5	4.6	4.5	4.2	4.4	4.3
SDG&E	14	3.1	3.1	3.1	4.6	4.6	4.6	-	4.6	-

2.3 ANALYSIS APPROACH

A billing-analysis approach was used to estimate measure savings. This methodology used multivariate regression models to estimate household energy use in terms of program participation, while controlling for changes in weather, household characteristics, and other market/demographic conditions.

The analysis was implemented using monthly data (in a pooled time series/cross-sectional model). The general form of the monthly model is:

$$Use_{it} = \mu_i + \tau_t + \beta_1 PART_{it} + \sum_{j=2}^{n} \beta_j X_{itj} + \varepsilon_{it}$$

where:

Use_{it} = Average daily electric or gas use for customer i in time period t
$PART_{it}$ = Program participation indicator for customer i in time period t equal to

		one after program implementation and zero prior to implementation
X_{itj}	=	Other explanatory variables that could affect energy use
μ_i	=	Dummy variable, 1 for customer i, 0 otherwise
τ_t	=	Dummy variable, 1.0 for time period t, 0.0 otherwise
β's	=	Estimated parameters
ε_{it}	=	Error term.

The parameter in the above equation is β_1, the coefficient reflecting impacts of program participation and installing measures. For the analysis, multiple PART variables are included to develop impact results by different measure groups. The program savings variables are interacted with other customer attributes (such as housing type and weather variables) to develop savings estimates that vary by key customer group. In an alternative specification, the PART variable can be replaced by engineering-based estimates of program savings (in kWh or therms per day). Then the β_1 coefficient represents an estimate of the program or measure realization rate, the fraction of the savings estimate realized in customer bills. This approach is taken for some measures.

The customer-specific level variables, μ_i, and the time-specific level variables, τ_t, are included to control for "fixed-effects," the stable but unmeasured characteristics of each customer and time period. The fitting of these two sets of fixed effects eliminates two important potential sources of intercorrelation among the model residuals. The customer-specific variables adjust for each customer's base use, facilitating the calibration to customer bills.

The X_{itj} variables include factors such as weather variables (interacted with the presence of space cooling and/or electric space heating) and customer classification variables (housing type, weather zone, etc.).

The models for this study were developed using data for all Program Year (PY) 2001 participants with valid billing data.

3 ANALYSIS AND RESULTS

3.1 OVERVIEW

This section describes the billing analysis model that was developed for this evaluation and presents the impact estimate results that were obtained from the models. Appendix B presents detailed impacts for each utility, by climate zone and dwelling type.

3.2 BILLING ANALYSIS

The electric and natural gas billing analysis models were developed utilizing all PY 2001 individually metered participants with adequate billing data. Two preliminary analyses were required prior to model development: (1) customer bills were analyzed to assess the presence of major end uses, which were then utilized as inputs into the billing analysis; and (2) engineering-based measure impacts were reviewed and incorporated into measure impact variables when it was not possible to isolate, within the billing analysis, the impacts of multiple measures targeted toward a single end use.

The preliminary analyses are discussed next, prior to a discussion of the billing analysis models developed for this study.

3.2.1 Assessment of Major End Uses

Because customers in the billing analysis were not surveyed, an additional analysis was conducted to assess the presence of major end uses (air conditioning, space heating by fuel, and water heating by fuel).

The major end-use ownership indicators were assigned to the sample using the average monthly usage profiles. Appliance ownership indicators were assigned to households that passed various usage criteria. For gas samples, space and water-heating ownership indicators were developed. For the electric samples, space-heating, water-heating, and air conditioning indicators were created. Baseline codes were used to create the space and water-heating indicators for Southern California Gas. Pacific Gas and Electric (PG&E) had information on central air conditioning. Analysis of average monthly usage was undertaken to determine appliance ownership for the remaining utilities.

In the case of gas space heating, customers using more than 30 therms in the winter months (December and January) or customers whose winter use was more than 50 percent greater than summer use (July and August) were assigned as gas space-heating customers. Analysis of summer use was employed to determine gas water heating. Customers whose monthly summer usage was 10 or more therms were assigned as gas water heating.

Electric space-heating and water-heating ownership were determined by looking at winter period use relative to spring season (April and May). Customers whose winter and spring electric use

exceeded 800 kWh per month were assigned to have both electric space heating and water heating. Customers whose winter monthly usage was over 700 kWh and more than 25 percent higher than spring monthly kWh were assigned electric space heating. Customers whose spring monthly usage was greater than 650 kWh were assigned electric water heating. In the case of air conditioning, customers whose summer monthly use exceeded 800 kWh were assigned electric air conditioning.

The introduction of key end uses was required to provide structure to the billing analysis models. For example, only customers with air conditioning were modeled to be affected by cooling degree-days variables and to have air conditioning savings affects due to weatherization measures. Similarly, customers with gas water heating showed gas savings for water-heating measures, and customers with electric water heating showed electric savings for the water-heating measures.

3.2.2 Incorporation of Engineering Impact Estimates

For weatherization and water-heating measures, it was possible to have multiple measures targeted at a single end use, but it was difficult to include too many measure variables into a single regression equation. In these cases, measures were combined into single variables, using engineering-based savings fractions as weighting factors that accounted for the fact that some measures were associated with higher impacts than others. The savings fractions were taken from the 2001 DEER Update Study[1] that provided engineering-based savings estimates for a variety of residential energy-efficiency measures.

Table 3-1 summarizes the weatherization savings percentages used in the study and Table 3-2 summarizes water-heating measure savings percentages used in the study.

Table 3-1
Engineering-Based Weatherization Savings Percentages

	Cooling		Heating	
Measure	Single Family	Multifamily	Single Family	Multifamily
Attic Insulation	25%	40%	30%	50%
Caulking	1%	0.5%	2%	2%
Weather Stripping	1%	0.5%	2%	3%
Minor Home Repairs	3%	3%	5%	5%
Furnace Filters			2%	2%
Evaporative Cooler Cover			1%	1%
Duct Sealing	8%	7%	10%	1%
Programmable Thermostat	2%	2%	2%	2%
Whole House Fan	20%	20%		

[1] KEMA-XENERGY Inc., 2001 DEER Update Study, prepared for the California Energy Commission, August 2001

Table 3-2
Engineering-Based Water-Heating Measure Savings Percentages

Measure	Percent Savings
Low Flow Shower	7.5%
Faucet Aerator	3%
Pipe Wrap	4%
WH Blanket	10%

In addition to savings percentages, it was necessary to predetermine the relative level of end-use consumption for multifamily versus single-family homes. This allowed for the combination of single-family/mobile home and multifamily measures into the same savings variable by providing weights that allowed aggregation across dwelling types. Analysis of PY2000 LIEE Program participants was conducted to develop end-use usage relationships between dwelling types, which are presented in Table 3-3.

Table 3-3
Relative End-Use Consumption: Multifamily Versus Single Family

End Use	Multifamily Usage as a Percent of Single Family Usage
Air Conditioning	80%
Electric Space Heating	70%
Gas Space Heating	50%
Electric Water Heating	60%
Gas Water Heating	80%

3.2.3 Electric Billing Analysis Model

Electric model results are presented in Table 3-4. The model has an R^2 of 0.81, which indicates that just over 80 percent of the variation in monthly kWh per day is explained by the model. This is a relatively high R^2 for models of this type. All key variables are statistically significant (with t-statistics over 2.0). Shaded rows indicate variables that are used to identify program impacts. Each variable is described as follows (with variable names in brackets):

- **[Evaporative cooling × CDD]** —A dummy variable indicating customers who received evaporative cooler measures interacted with cooling degree-days. This term identifies base cooling load for customers who received evaporative coolers through the program.
- **[Evaporative cooling × CDD × multifamily]** —A dummy variable indicating customers who received evaporative cooler measures interacted with cooling degree-days and a dummy variable for multifamily dwellings. This term combined with the prior term identifies base cooling load for multifamily homes.

Table 3-4
Electric Model—All Available Participants—Dependent Variable—Monthly kWh per Day

Variable	Parameter estimate	t-statistic
Evaporative cooling * CDD	0.841806	397.43
Evaporative cooling * CDD * multifamily	-0.176797	-67.58
Evaporative cooling* CDD * POST	-0.191048	-46.75
Evaporative cooling* CDD * POST * multifamily	0.124771	23.58
Evaporative cooler maintenance * CDD	0.696858	315.29
Evaporative cooler maintenance * CDD * POST	-0.027718	-8.96
CAC * CDD	0.609481	168.49
CAC * CDD * POST	-0.145554	-31.23
RAC * CDD	0.354896	54.26
RAC * CDD * POST	-0.113246	-12.68
AC * CDD	1.082334	550.26
AC * CDD * multifamily	-0.182970	-73.26
AC * CDD * mobile home	-0.120480	-30.36
AC * CDD * POST * weatherization savings	-0.000263	-10.30
Electric heating * HDD	0.767708	79.74
Electric heating * HDD * multifamily	-0.180066	-18.78
Electric heating * HDD * mobile home	-0.163897	-14.64
Electric heating * HDD * POST * weatherization savings	-0.000255	-11.72
Refrigerator * POST * refrigerator savings	-1.173974	-103.31
Refrigerator * POST * refrigerator savings * non-single family	0.191576	12.86
POST * (number of CFLs distributed* CFL savings + number of porch lights distributed * porch light savings)	-1.081401	-27.32
POST * (number of CFLs distributed* CFL savings + number of porch lights distributed * porch light savings) * non-single family	0.330423	8.56
Electric water heat * POST * sum(measure savings)	-0.001154	-7.32
Customer fixed effects		F=97.98
Dummy variable, 1/2000	0.549545	23.19
Dummy variable, 2/2000	-0.102284	-4.45
Dummy variable, 3/2000	-0.286156	-12.87
Dummy variable, 4/2000	-1.100962	-48.24
Dummy variable, 5/2000	-1.129092	-50.64
Dummy variable, 6/2000	-0.370427	-16.66
Dummy variable, 7/2000	0.420754	18.57
Dummy variable, 8/2000	1.246256	56.67
Dummy variable, 9/2000	0.299311	13.39
Dummy variable, 10/2000	-0.254925	-11.59
Dummy variable, 11/2000	-0.325097	-14.74
Dummy variable, 12/2000	0.541002	24.72
Dummy variable, 1/2001	0.593620	27.59
Dummy variable, 2/2001	0.098548	4.46
Dummy variable, 3/2001	-0.327675	-15.34
Dummy variable, 4/2001	-1.365367	-63.80
Dummy variable, 5/2001	-1.571376	-73.70
Dummy variable, 6/2001	-1.100703	-51.50
Dummy variable, 7/2001	-0.244811	-11.37
Dummy variable, 8/2001	0.071439	3.36
Dummy variable, 9/2001	0.073697	3.35
Dummy variable, 10/2001	-0.614772	-28.48
Dummy variable, 11/2001	-0.781596	-35.40
Dummy variable, 12/2001	0.347929	15.60
Dummy variable, 1/2002	0.827494	37.30
Dummy variable, 2/2002	0.358887	15.76
Dummy variable, 3/2002	-0.580790	-25.94
Dummy variable, 4/2002	-0.945365	-42.40
Dummy variable, 5/2002	-1.222011	-54.66
Dummy variable, 6/2002	-0.734951	-32.23
Dummy variable, 7/2002	0.416644	18.43
Dummy variable, 8/2002	0.893066	39.36
Dummy variable, 9/2002	0.439902	19.07
R^2	0.8053	
Number of observations	2,966,778	

- **[Evaporative cooling × CDD × POST]**—The evaporative cooler dummy variable interacted with cooling degree-days and a post-retrofit dummy variable that takes on the value of 0.0 in periods prior to the program install date and 1.0 in periods after the program install date. This term identifies savings related to installation of program evaporative coolers for single-family homes.
- **[Evaporative cooling × CDD × POST × multifamily]**—The evaporative cooler dummy variable interacted with cooling degree-days, and the post-retrofit dummy variable, and a dummy variable for multifamily dwellings. This term combined with the prior term identifies savings related to installation of program evaporative coolers for multifamily homes.
- **[Evaporative cooler maintenance × CDD]** —A dummy variable indicating customers who received evaporative cooler maintenance interacted with cooling degree-days. This term identifies base cooling load for customers who received evaporative cooler maintenance through the program.
- **[Evaporative cooler maintenance × CDD × POST]**—The evaporative cooler maintenance dummy variable interacted with cooling degree-days and the post-retrofit dummy variable. This term identifies savings related to the evaporative cooler maintenance measure.
- **[CAC × CDD]** —A dummy variable indicating customers who received a central air conditioner from the program interacted with cooling degree-days. This term identifies base cooling load for customers who received new central air conditioners through the program.
- **[CAC × CDD × POST]**—The program central air conditioner dummy variable interacted with cooling degree-days and the post-retrofit dummy variable. This term identifies savings related to installation of central air conditioners.
- **[RAC × CDD]** —A dummy variable indicating customers who received a room air conditioner from the program interacted with cooling degree-days. This term identifies base cooling load for customers who received new room air conditioners through the program.
- **[RAC × CDD × POST]**—The program room air conditioner dummy variable interacted with cooling degree-days and the post-retrofit dummy variable. This term identifies savings related to installation of room air conditioners.
- **[AC × CDD]**—A dummy variable indicating the presence of air conditioning interacted with cooling degree-days. This term identifies base cooling load for single-family homes.
- **[AC × CDD × multifamily]**—The air conditioning dummy variable interacted with cooling degree-days and a dummy variable for multifamily dwellings. This term combined with the prior term identifies base cooling load for multifamily homes.
- **[AC × CDD × mobile home]**—The air conditioning dummy variable interacted with cooling degree-days and a dummy variable for multifamily dwellings. This term combined with the [AC × CDD] term identifies base cooling load for mobile homes.

- **[AC × CDD × POST × weatherization savings]**—The air conditioning dummy variable interacted with cooling degree-days, the post-retrofit dummy variable, and the relative effect of space cooling weatherization savings using combinations of values from Table 3-1, depending on the particular measures installed in each home. This term identifies air conditioning savings from the installation of weatherization measures.
- **[Electric heating × HDD]—**A dummy variable indicating the presence of electric heating interacted with heating degree-days. This term identifies base heating load for single-family homes.
- **[Electric heating × HDD × multifamily]—**The electric heating dummy variable interacted with heating degree-days and a dummy variable for multifamily dwellings. This term combined with the prior term identifies base heating load for multifamily homes.
- **[Electric heating × HDD × mobile home]—**The electric heating dummy variable interacted with heating degree-days and a dummy variable for mobile homes. This term combined with the [Electric heating × HDD] term identifies base heating load for mobile homes.
- **[Electric heating × HDD × POST × weatherization savings]**—The electric heating dummy variable interacted with heating degree-days, the post-retrofit dummy variable, and the relative effect of space-heating weatherization savings using combinations of values from Table 3-1, depending on the particular measures installed in each home. This term identifies electric heating savings from the installation of weatherization measures.
- **[Refrigerator × POST × refrigerator savings]**—The refrigerator dummy variable interacted with the post-retrofit dummy variable and an initial estimate of refrigerator savings. This estimate is equal to 677 kWh per year. This term identifies refrigerator savings for single-family homes.
- **[Refrigerator × POST × refrigerator savings × non-single family]**—The refrigerator dummy variable interacted with the post-retrofit dummy variable, the initial estimate of refrigerator savings (same as for single-family, or 677 kWh per year), and a dummy variable for non-single-family homes (i.e., mobile homes and multifamily dwellings). This term identifies refrigerator savings for mobile homes and multifamily dwellings.
- **[POST × (number of CFLs × CFL savings + number of porch lights × porch light savings)]**—The post-retrofit dummy variable interacted with the number of CFLs that the tracking system indicates were provided to the customer multiplied by an initial estimate of CFL savings (22 kWh per year) plus the number of porch lights that the tracking system indicates were provided to the customer multiplied by an initial estimate of porch light savings (32 kWh per year). This term identifies program CFL and porch light savings for single-family homes.
- **[POST × (number of CFLs × CFL savings + number of porch lights × porch light savings) × non-single family]**—The post-retrofit dummy variable interacted

with the number of CFLs that the tracking system indicates were provided to the customer multiplied by the initial estimate of CFL savings plus the number of porch lights that the tracking system indicates were provided to the customer multiplied by an initial estimate of porch light savings and a dummy variable for non-single-family homes. This term identifies program CFL and porch light savings for mobile homes and multifamily dwellings.

- **[Electric water heat × POST × water-heating savings]**—A dummy variable indicating the presence of electric water heating interacted with the post-retrofit dummy variable and the relative effect of water-heating measure savings using combinations of values from Table 3-2, depending on the particular measures installed in each home. This term identifies electric water-heating savings from the installation of program measures.
- **[Customer fixed effects]—**These variables allow for a different intercept term for each participant, accounting for variations in bill size due to dwelling and household effects that are outside of the program.
- **[Monthly dummy variables]—**These variables account for unexplained seasonality of use and non-program variations over time.

3.2.4 Natural Gas Model

Gas model results are presented in Table 3-5. The model has an R^2 of 0.73, which indicates that about 73 percent of the variation in monthly therms per day is explained by the model. Again this R^2 indicates a relatively good model fit. All key variables are statistically significant (with t-statistics over 2.0). Shaded rows indicate variables that are used to identify program impacts. Each variable is described as follows (with variable names in brackets):

- **[Gas heating × HDD]—**A dummy variable indicating the presence of gas heating interacted heating degree-days. This term identifies base heating load for single-family homes.
- **[Gas heating × HDD × multifamily]**—The gas heating dummy variable interacted with heating degree-days and a dummy variable for multifamily dwellings. This term combined with the prior term identifies base heating load for multifamily homes.
- **[Gas heating × HDD × mobile home]**—The gas heating dummy variable interacted with heating degree-days and a dummy variable for mobile homes. This term combined with the [Gas heating × HDD] term identifies base heating load for mobile homes.
- **[Furnace replace × HDD × operable furnace]**—A dummy variable denoting customers who received furnace replacements interacted with heating degree-days and a dummy variable for customers who had an operable furnace prior to receiving their new furnace. This term identifies base heating load for customers who received new furnaces and had previously operable furnaces.
- **[Furnace replace × HDD × POST × operable furnace]**—The furnace replacement dummy variable interacted with heating degree-days, the post-retrofit dummy

variable, and the previously operable furnace dummy variable. This term identifies gas heating savings for customers who received new furnaces and had previously operable furnaces.

Table 3-5
Natural Gas Model—All Available Participants
Dependent Variable—Monthly Therms per Day

Variable	Parameter estimate	t-statistic
Gas heating * HDD	0.144218	455.53
Gas heating * HDD * multifamily	-0.092786	-276.49
Gas heating * HDD * mobilehome	-0.002264	-5.24
Furnace replace * HDD * operable furnace	0.169682	261.13
Furnace replace * HDD * POST * operable furnace	-0.026833	-31.88
Furnace replace * HDD * POST * inoperable furnace	0.130286	149.87
Furnace repair * HDD * operable furnace	0.122772	162.38
Furnace repair * HDD * POST * operable furnace	-0.017870	-18.13
Furnace repair * HDD * POST * inoperable furnace	0.105049	86.80
Gas heating * HDD * POST * weatherization savings	-0.000194	-64.26
Gas water heating * HDD * POST * water-heating savings	-0.001406	-34.39
Water heater * POST	-0.052177	-9.27
Water heater * POST * multifamily	0.026249	2.08
Customer fixed effects		F=46.46
R^2	0.7328	
Number of observations	1,601,799	

- **[Furnace replace × HDD × POST × inoperable furnace]**—The furnace replacement dummy variable interacted with heating degree-days, the post-retrofit dummy variable, and a dummy variable for customers who had an inoperable furnace prior to receiving their new furnace. This term identifies gas heating savings for customers who received new furnaces and had previously inoperable furnaces. Customers with inoperable furnaces prior to treatment from the program increase their load, as reflected by the positive sign of the coefficient.
- **[Furnace repair × HDD × operable furnace]**—A dummy variable denoting customers who received furnace repairs interacted with heating degree-days and the operable furnace dummy variable. This term identifies base heating load for customers who received furnace repairs and had previously operable furnaces.
- **[Furnace repair × HDD × POST × operable furnace]**—The furnace repair dummy variable interacted with heating degree-days, the post-retrofit dummy variable, and the previously operable furnace dummy variable. This term identifies gas heating savings for customers who received furnace repairs and had previously operable furnaces.

- **[Furnace repair × HDD × POST × inoperable furnace]**—The furnace repair dummy variable interacted with heating degree-days, the post-retrofit dummy variable, and the inoperable furnace dummy variable. This term identifies gas heating savings for customers who received furnace repairs and had previously inoperable furnaces. As mentioned above, customers with inoperable furnaces prior to treatment from the program increase their load, as reflected by the positive sign of the coefficient.
- **[Gas heating × HDD × POST × weatherization savings]**—The gas heating dummy variable interacted with heating degree-days, the post-retrofit dummy variable, and the relative effect of space-heating weatherization savings using combinations of values from Table 3-1, depending on the particular measures installed in each home. This term identifies gas heating savings from the installation of weatherization measures.
- **[Gas water heat × POST × water-heating savings]—**A dummy variable indicating the presence of gas water heating interacted with the post-retrofit dummy variable and the relative effect of water-heating measure savings using combinations of values from Table 3-2, depending on the particular measures installed in each home. This term identifies gas water-heating savings from the installation of program measures.
- **[Water heater × POST]** —A dummy variable indicating customers who received gas water heaters interacted with the post-retrofit dummy variable. This term identifies gas water-heating savings for single-family and mobile homes from the installation of the water heater.
- **[Water heater × POST × multifamily]** —A dummy variable indicating customers who received gas water heaters interacted with the post-retrofit dummy variable and the multifamily dummy variable. This term identifies gas water-heating savings for multifamily dwellings from the installation of the water heater.
- **[Customer fixed effects]—**These variables allow for a different intercept term for each participant, accounting for variations in bill size due to dwelling and household effects that are outside of the program.

Note that monthly dummy variables were not included in the gas model. Due to the large seasonal component of gas use, the monthly dummy variables tended to interfere with the estimation of gas space-heating savings.

3.3 IMPACT ESTIMATES

3.3.1 Calculation of Impacts

Impact estimates were developed using the billing analysis models discussed above. The models were simulated for each household under two conditions:

1. Assuming no LIEE program measures were installed
2. Assuming all LIEE program measures were installed as tracked.

All non-program variables, such as household characteristics and weather, are held constant for the simulations. The resulting differences between the simulations provide estimates of measure savings. Since normal weather variables are used in the simulation process, weather-sensitive measure impacts reflect normal weather conditions.

Customer-specific impacts are then averaged to provide program unit savings. Weights were developed to ensure that the sample of customers reflected the program population for the averaging process.

Next, measure counts were developed for each relevant combination of measure, dwelling type, and fuel. For weatherization measures, this involved determining each participant's heating fuel type and whether or not space cooling was present. For water-heating measures, this involved determining each participant's fuel type.

Finally, program impacts are estimated by multiplying unit impacts time measure counts.

3.3.2 Impact Estimates

Per-unit measure savings for non-weather-sensitive measures are presented in Table 3-6. These savings were not found to vary significantly by utility. The primary variation in unit impacts occurs between single-family dwellings and other dwelling types. Unit savings are expressed on a per-home basis, except for CFLs, which are expressed on a per-bulb basis.

Table 3-6
Annual Per-Unit Savings—Non-Weather-Sensitive Measures

Measure	Dwelling Type	kWh per Year	Therms per Year
Faucet Aerators	Multifamily	26.5	2.6
	Mobile Home	26.5	2.6
	Single Family	43.4	3.6
Low Flow Showerhead	Multifamily	66.6	7.2
	Mobile Home	66.6	7.2
	Single Family	108.7	8.2
Water Heater Replacement	Multifamily	118.0	9.5
	Mobile Home		19.0
	Single Family		19.0
Water Heater Blanket	Multifamily	88.5	9.2
	Mobile Home	88.5	9.2
	Single Family	145.3	11.3
Water Heater Pipe Wrap	Multifamily	35.4	3.6
	Mobile Home	35.4	3.6
	Single Family	58.1	4.6
CFL	Multifamily	16.4	
	Mobile Home	16.4	
	Single Family	23.7	
Porch Light	Multifamily	24.2	
	Mobile Home	24.2	
	Single Family	35.6	
Refrigerator	Multifamily	665.1	
	Mobile Home	665.1	
	Single Family	794.8	

Average per-unit savings for measures affecting weather-sensitive end uses are presented in Table 3-7. These impacts, which vary by climate zone and utility, are summarized here. Tables 3-8 through 3-11 show impacts summarized by utility, and Appendix B shows impacts by climate zone. While impacts tend to be highest for single-family dwellings and lowest for multifamily dwellings, statewide average impacts by dwelling type are greatly influenced by the distribution of dwellings across the various climate zones in California.

Table 3-7
Annual Per-Unit Savings—Weather-Sensitive Measures—kWh and Therms per Year

Measure	Dwelling Type	kWh		Therms
		Heating	Cooling	Heating
Attic Insulation	Multifamily	258.0	190.6	23.9
	Mobile Home			
	Single Family	274.7	206.1	33.8
Caulking	Multifamily	9.9	1.8	1.5
	Mobile Home	11.4	1.7	3.2
	Single Family	18.1	5.2	3.8
Central AC	Multifamily		565.9	
	Mobile Home		179.0	
	Single Family		240.1	
Duct Sealing	Multifamily	5.2	21.3	1.1
	Mobile Home		4.7	8.1
	Single Family	93.0	35.5	10.0
Evaporative Cooler Cover	Multifamily	5.9		0.7
	Mobile Home	6.1		2.0
	Single Family	9.5		2.8
Evaporative Cooler Installation	Multifamily		105.9	
	Mobile Home		353.7	
	Single Family		326.9	
Evaporative Cooler Maintenance	Multifamily		54.4	
	Mobile Home		94.4	
	Single Family		71.4	
Furnace Filters	Multifamily	11.0		1.4
	Mobile Home	12.7		2.0
	Single Family	17.7		3.8
Furnace Repair	Multifamily			30.1
	Mobile Home			28.0
	Single Family			30.8
Furnace Replacement	Multifamily			60.1
	Mobile Home			33.8
	Single Family			34.5
Minor Home Repair	Multifamily	22.8	11.2	2.4
	Mobile Home	26.2	10.3	4.5
	Single Family	42.7	15.3	6.2
Programmable Thermostat	Multifamily	1.0	16.4	1.8
	Mobile Home	18.5	9.8	1.2
	Single Family	19.5	8.4	2.7
Room AC	Multifamily		270.2	
	Mobile Home			
	Single Family			
Weatherstripping	Multifamily	14.1	1.8	1.6
	Mobile Home	18.8	1.8	3.2
	Single Family	18.2	5.1	3.2
Whole-House Fan	Multifamily		90.5	
	Mobile Home			
	Single Family		108.5	

Tables 3-9 through 3-12 provide estimates of program impacts by utility.

SCE

SCE impacts are presented in Table 3-9. Overall, the PY2001 LIEE program is estimated to be saving 18.9 GWh per year in the SCE area. Key measures include CFLs/porch lights with savings of 6.8 GWh, new refrigerators with savings of 10.0 GWh, and evaporative coolers with savings of 1.2 GWh. A large portion of SCE refrigerator impacts (5.4 GWh) is associated with multifamily dwellings, which are predominantly occupied by renters. Program changes in PY2001 allowed qualified renters to receive replacement refrigerators, opening up the Program to new markets. The relatively large electric impacts for SCE relative to the other utilities is mainly due to higher distribution of CFLs and refrigerators. In 2001, SCE provided 56 percent of the Program refrigerators and 63 percent of the CFLs/porch lights.

PG&E

PG&E impacts are presented in Table 3-10. Overall, the PY2001 LIEE program is estimated to be saving 9.0 GWh per year and 0.68 million therms per year in the PG&E area. Similar to SCE, key electricity-saving measures include CFLs with savings of 3.2 GWh, new refrigerators with savings of 4.2 GWh, and evaporative coolers with savings of 1.1 GWh. The major gas-saving measures include attic insulation (0.103 Mth), building repairs (0.096 Mth), and low-flow showerheads (0.159 Mth).

SDG&E

SDG&E impacts are presented in Table 3-11. Overall, the PY2001 LIEE program is estimated to be saving 4.6 GWh per year and 0.28 million therms per year in the SDG&E area. Key electricity-saving measures include CFLs with savings of 0.7 GWh and new refrigerators with savings of 3.8 GWh. The major gas-saving measures include low-flow showerheads (0.051 Mth), building repairs (0.048 Mth), and caulking/weatherstripping (0.03 Mth each). Similar to SCE, a large portion of new refrigerator savings (1.8 GWh) is associated with multifamily dwellings.

SCG

SCG impacts are presented in Table 3-12. Overall, the PY2001 LIEE program is estimated to be saving 0.74 million therms per year in the SCG area. Key measures include low-flow showerheads with savings of 0.265 Mth, faucet aerators with savings of 0.95 Mth, minor home repair with savings of 0.090 Mth, and furnace replacement with savings of 0.090 Mth.

Table 3-8
SCE LIEE Program Impact Estimates for PY2001

Measure	Dwelling Type	Unit Savings			Measure Counts			Total Savings		
		kWh		Therms	kWh		Therms	kWh		Therms
		Heating and Other	Cooling	Heating and Other	Heating and Other	Cooling	Heating and Other	Heating and Other	Cooling	Heating and Other
CFL	Multifamily	16.4			186,060			3,052,903		
	Mobile Home	16.4			30,189			495,346		
	Single Family	23.7			67,457			1,601,071		
Faucet Aerators	Multifamily	26.5			620			16,430		
	Mobile Home									
	Single Family	43.4			12			521		
Low Flow Showerhead	Multifamily	66.6			1,265			84,249		
	Mobile Home									
	Single Family	108.7			14			1,522		
Porch Light	Multifamily	24.2			38,099			921,996		
	Mobile Home	24.2			7,003			169,473		
	Single Family	35.6			14,830			527,392		
Refrigerator	Multifamily	665.1			8,181			5,441,183		
	Mobile Home	665.1			1,722			1,145,302		
	Single Family	794.8			4,348			3,455,790		
Water Heater Replacement	Multifamily	118.0			114			13,452		
	Mobile Home									
	Single Family									
Water Heater Blanket	Multifamily	88.5			126			11,151		
	Mobile Home									
	Single Family	145.3			4			581		
Water Heater Pipe Wrap	Multifamily	35.4			112			3,965		
	Mobile Home									
	Single Family									
Attic Insulation	Multifamily	162.5			1			163		
	Mobile Home									
	Single Family									
Caulking	Multifamily	7.6	1.9		912	253		6,969	488	
	Mobile Home									
	Single Family	13.2			2			27		
Central AC	Multifamily		571.1			504			287,859	
	Mobile Home		213.1			11			2,344	
	Single Family		213.2			22			4,691	
Duct Sealing	Multifamily		17.2			50			862	
	Mobile Home									
	Single Family									
Evaporative Cooler Cover	Multifamily	4.7			1			5		
	Mobile Home									
	Single Family	11.2			1			11		
Evaporative Cooler Installation	Multifamily		129.6			512			66,366	
	Mobile Home		405.4			728			295,135	
	Single Family		308.2			2,709			834,964	
Evaporative Cooler Maintenance	Multifamily		54.4			2,473			134,540	
	Mobile Home		94.8			689			65,335	
	Single Family		72.0			1,387			99,867	
Minor Home Repair	Multifamily	19.8	12.0		1,458	137		28,870	1,643	
	Mobile Home									
	Single Family	33.3	11.3		15	1		500	11	
Programmable Thermostat	Multifamily		16.6			40			664	
	Mobile Home									
	Single Family									
Room AC	Multifamily		372.7			254			94,657	
	Mobile Home									
	Single Family									
Weatherstripping	Multifamily	11.6	1.8		1,545	307		17,952	544	
	Mobile Home									
	Single Family	20.7	3.9		15	1		311	4	
Total								16,997,133	1,889,973	

Table 3-9
PG&E LIEE Program Impact Estimates for PY2001

Measure	Dwelling Type	Unit Savings			Measure Counts			Total Savings		
		kWh		Therms	kWh		Therms	kWh		Therms
		Heating and Other	Cooling	Heating and Other	Heating and Other	Cooling	Heating and Other	Heating and Other	Cooling	Heating and Other
CFL	Multifamily	16.4			68,028			1,116,215		
	Mobile Home	16.4			18,877			309,737		
	Single Family	23.7			74,905			1,777,847		
Faucet Aerators	Multifamily	26.5		2.6	278		9,967	7,367		25,914
	Mobile Home	26.5		2.6	93		3,082	2,465		8,013
	Single Family	43.4		3.6	245		11,565	10,633		41,634
Low Flow Showerhead	Multifamily	66.6		7.2	264		8,983	17,582		64,678
	Mobile Home	66.6		7.2	80		2,231	5,328		16,063
	Single Family	108.7		8.2	192		9,603	20,870		78,745
Porch Light	Multifamily	24.2			43			1,041		
	Mobile Home	24.2			290			7,018		
	Single Family	35.6			914			32,504		
Refrigerator	Multifamily	665.1			1,348			896,555		
	Mobile Home	665.1			1,223			813,417		
	Single Family	794.8			3,076			2,444,805		
Water Heater Replacement	Multifamily			9.5			128			1,216
	Mobile Home			19.0			199			3,781
	Single Family			19.0			318			6,042
Water Heater Blanket	Multifamily	88.5		9.2	33		1,100	2,921		10,120
	Mobile Home	88.5		9.2	22		475	1,947		4,370
	Single Family	145.3		11.3	51		2,407	7,410		27,199
Water Heater Pipe Wrap	Multifamily	35.4		3.6	77		479	2,726		1,724
	Mobile Home	35.4		3.6	20		147	708		529
	Single Family	58.1		4.6	93		393	5,403		1,808
Attic Insulation	Multifamily	269.9	190.6	34.3	8	74	357	2,160	14,108	12,245
	Mobile Home									
	Single Family	281.8	207.7	41.5	99	384	2,191	27,900	79,765	90,833
Caulking	Multifamily	11.8	1.9	1.4	1,731	1,371	7,999	20,499	2,581	11,478
	Mobile Home	12.9	1.9	1.9	173	413	2,813	2,234	778	5,281
	Single Family	19.3	5.2	3.9	667	2,264	9,809	12,890	11,859	37,832
Central AC	Multifamily		184.6			7			1,292	
	Mobile Home		224.7			54			12,133	
	Single Family		248.2			73			18,120	
Duct Sealing	Multifamily	5.2	33.8	1.1	2	16	48	10	541	54
	Mobile Home			15.2			4			61
	Single Family	93.0	41.7	14.5	5	73	245	465	3,042	3,561
Evaporative Cooler Cover	Multifamily	6.0		0.9	23		170	138		149
	Mobile Home	6.8		0.9	35		1,385	238		1,247
	Single Family	9.4		3.3	36		1,047	340		3,457
Evaporative Cooler Installation	Multifamily		98.0			1,540			150,895	
	Mobile Home		294.6			637			187,658	
	Single Family		349.3			2,260			789,527	
Evaporative Cooler Maintenance	Multifamily		47.5			11			522	
	Mobile Home		47.0			6			282	
	Single Family		61.8			88			5,437	
Furnace Filters	Multifamily	11.0		1.4	349		4,428	3,827		5,996
	Mobile Home	12.7		2.0	119		2,267	1,516		4,433
	Single Family	17.7		3.8	268		5,698	4,752		21,436
Furnace Repair	Multifamily			39.8			20			795
	Mobile Home			40.8			78			3,184
	Single Family			39.0			510			19,890
Furnace Replacement	Multifamily			60.1			6			360
	Mobile Home			62.4			25			1,560
	Single Family			61.5			101			6,214
Minor Home Repair	Multifamily	31.7	11.9	3.7	719	1,045	5,320	22,828	12,478	19,493
	Mobile Home	33.2	11.5	4.3	117	241	1,730	3,887	2,764	7,391
	Single Family	48.2	15.5	8.2	571	1,960	8,472	27,504	30,413	69,188
Programmable Thermostat	Multifamily	1.0	9.8	1.8	1	1	20	1	10	36
	Mobile Home	18.5	9.8	2.1	2	3	92	37	29	190
	Single Family	19.5	8.4	2.7	5	12	102	98	101	275
Weatherstripping	Multifamily	18.6	1.9	2.3	1,220	1,011	7,314	22,683	1,894	16,833
	Mobile Home	19.9	1.9	2.8	162	394	2,697	3,227	733	7,632
	Single Family	19.4	5.1	3.9	714	1,358	9,742	13,868	6,987	37,783
Whole House Fan	Multifamily		90.5			10			905	
	Mobile Home									
	Single Family		106.8			87			9,290	
Total								7,655,598	1,344,145	680,720

Table 3-10
SDG&E LIEE Program Impact Estimates for PY2001

Measure	Dwelling Type	Unit Savings			Measure Counts			Total Savings		
		kWh		Therms	kWh		Therms	kWh		Therms
		Heating and Other	Cooling	Heating and Other	Heating and Other	Cooling	Heating and Other	Heating and Other	Cooling	Heating and Other
CFL	Multifamily	16.4			8,931			146,541		
	Mobile Home	16.4			18,554			304,437		
	Single Family	23.7			8,757			207,845		
Faucet Aerators	Multifamily	26.5		2.6	136		3,237	3,604		8,416
	Mobile Home	26.5		2.6	1		679	27		1,765
	Single Family	43.4		3.6	519		4,502	22,525		16,207
Low Flow Showerhead	Multifamily	66.6		7.2	147		2,766	9,790		19,915
	Mobile Home	66.6		7.2	2		685	133		4,932
	Single Family	108.7		8.2	345		3,194	37,502		26,191
Porch Light	Multifamily	24.2			1			24		
	Mobile Home									
	Single Family	35.6			18			640		
Refrigerator	Multifamily	665.1			2,641			1,756,529		
	Mobile Home	665.1			2,010			1,336,851		
	Single Family	794.8			832			661,274		
Water Heater Replacement	Multifamily									
	Mobile Home			19.0			400			7,600
	Single Family			19.0			23			437
Water Heater Blanket	Multifamily	88.5		9.2	3		43	266		396
	Mobile Home			9.2			135			1,242
	Single Family	145.3		11.3	46		724	6,684		8,181
Water Heater Pipe Wrap	Multifamily	35.4		3.6	2		11	71		40
	Mobile Home			3.6			157			565
	Single Family	58.1		4.6	140		620	8,134		2,852
Attic Insulation	Multifamily									
	Mobile Home									
	Single Family	157.3	49.7	26.0	6	4	268	944	199	6,965
Caulking	Multifamily	7.3	1.1	2.0	483	196	2,985	3,529	216	6,114
	Mobile Home	6.9	1.2	4.4	57	97	4,492	394	112	19,814
	Single Family	10.7	2.6	4.6	114	33	1,612	1,219	84	7,428
Central AC	Multifamily									
	Mobile Home		164.3			194			31,874	
	Single Family									
Duct Sealing	Multifamily			1.0			10			10
	Mobile Home		4.7	8.1		58	2,465		270	19,924
	Single Family		10.4	8.7		18	831		187	7,252
Evaporative Cooler Cover	Multifamily									
	Mobile Home	3.6		6.3	9		428	32		2,685
	Single Family									
Evaporative Cooler Installation	Multifamily									
	Mobile Home									
	Single Family		157.1			2			314	
Furnace Repair	Multifamily			26.2			50			1,311
	Mobile Home			26.7			462			12,339
	Single Family			25.0			159			3,980
Furnace Replacement	Multifamily									
	Mobile Home			40.6			340			13,803
	Single Family			38.7			56			2,169
Minor Home Repair	Multifamily	18.4	6.4	3.5	464	190	3,451	8,524	1,214	12,149
	Mobile Home	17.1	6.8	5.1	90	79	4,045	1,541	534	20,734
	Single Family	27.4	7.8	7.0	193	53	2,207	5,282	415	15,419
Programmable Thermostat	Multifamily									
	Mobile Home			1.0			334			341
	Single Family									
Room AC	Multifamily		128.7			184			23,681	
	Mobile Home									
	Single Family									
Weatherstripping	Multifamily	11.1	1.1	2.7	524	199	3,301	5,817	218	9,031
	Mobile Home	10.9	1.1	5.1	24	57	2,847	262	65	14,573
	Single Family	10.7	2.6	4.7	123	35	1,670	1,312	90	7,840
Whole House Fan	Multifamily									
	Mobile Home									
	Single Family		259.2			1			259	
Total								4,531,730	59,732	282,622

A

M&E PROTOCOLS TABLES 6 AND 7

This appendix contains M&E Protocols Tables 6 and 7.

A.1 TABLE 6

M&E PROTOCOLS TABLE 6

Low Income Energy Efficiency Program

ENDUSE: Whole building
Designated Unit of Measurement: Dwelling

1. Average Participant Group and Average Comaprison Group		Participant	Comparison								
A. Pre-install usage:	Pre-install kW	na	na								
	Pre-install kWh	na	na								
	Pre-install Therms	na	na								
	Base kW	na	na								
	Base kWh	na	na								
	Base Therms	na	na								
	Base kW/ designated unit of measurement	na	na								
	Base kWh/ designated unit of measurement	na	na								
	Base Therms/ designated unit of measurement	na	na								
B. Impact year usage:	Impact Yr kW	na	na								
	Impact Yr kWh	na	na								
	Impact Yr Therms	na	na								
	Impact Yr kW/designated unit	na	na								
	Impact Yr kWh/designated unit	na	na	5. A. 90% CONFIDENCE LEVEL				5. B. 80% CONFIDENCE LEVEL			
	Impact Yr Therms/designated unit	na	na	LOW BND	UP BND	LOW BND	UP BND	LOW BND	UP BND	LOW BND	UP BND
2. Average Net and Gross End Use Load Impacts		AVG GROSS	AVG NET	AVG GROSS	AVG GROSS	AVG NET	AVG NET	AVG GROSS	AVG GROSS	AVG NET	AVG NET
	A. i. Load Impacts - kW	na	na	na	na	na	na	na	na	na	na
	A. ii. Load Impacts - kWh	32,478,309	32,478,309	31,154,198	33,801,413	31,154,198	33,801,413	31,436,621	33,518,990	31,436,621	33,518,990
	A. iii. Load Impacts - Therms	1,703,750	1,703,750	1,631,261	1,777,994	1,631,261	1,777,994	1,646,915	1,762,340	1,646,915	1,762,340
	B. i. Load Impacts/designated unit - kW	na	na	na	na	na	na	na	na	na	na
	B. ii. Load Impacts/designated unit - kWh	225	225	216	234	216	234	218	233	218	233
	B. iii. Load Impacts/designated unit - Therms	19	19	18	20	18	20	18	20	18	20
	C. i. a. % change in usage - Part Grp - kW	na	na	na	na	na	na	na	na	na	na
	C. i. b. % change in usage - Part Grp - kWh	na	na	na	na	na	na	na	na	na	na
	C. i. c. % change in usage - Part Grp - Therms	na	na	na	na	na	na	na	na	na	na
	C. ii. a. % change in usage - Comp Grp - kW	na	na	na	na	na	na	na	na	na	na
	C. ii. b. % change in usage - Comp Grp - kWh	na	na	na	na	na	na	na	na	na	na
	C. ii. c. % change in usage - Comp Grp - Therms	na	na	na	na	na	na	na	na	na	na
D. Realization Rate:	D.A. i. Load Impacts - kW, realization rate	na	na	na	na	na	na	na	na	na	na
	D.A. ii. Load Impacts - kWh, realization rate	na	na	na	na	na	na	na	na	na	na
	D.A. iii. Load Impacts - Therms, realization rate	na	na	na	na	na	na	na	na	na	na
	D.B. i. Load Impacts/designated unit - kW, real rate	na	na	na	na	na	na	na	na	na	na
	D.B. ii. Load Impacts/designated unit - kWh, real rate	na	na	na	na	na	na	na	na	na	na
	D.B. iii. Load Impacts/designated unit - Therms, real rate	na	na	na	na	na	na	na	na	na	na
3. Net-to-Gross Ratios		RATIO		RATIO	RATIO			RATIO	RATIO		
	A. i. Average Load Impacts - kW	na		na	na			na	na		
	A. ii. Average Load Impacts - kWh	1.00		na	na			na	na		
	A. iii. Average Load Impacts - Therms	1.00		na	na			na	na		
	B. i. Avg Load Impacts/designated unit of measurement - kW	na		na	na			na	na		
	B. ii. Avg Load Impacts/designated unit of measurement - kWh	1.00		na	na			na	na		
	B. iii. Avg Load Impacts/designated unit of measurement - Therms	1.00		na	na			na	na		
	C. i. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - kW	na		na	na			na	na		
	C. ii. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - kWh	1.00		na	na			na	na		
	C. iii. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - Thms	1.00		na	na			na	na		
4. Designated Unit Intermediate Data		PART GRP	NP GRP					PART GRP	PART GRP		
	A. Pre-install average value	na	na					na	na		
	B. Post-install average value	na	na					na	na		
6. Measure Count Data		NUMBER									
	A. Number of Electric measures installed by participants	144,153	(Total number of dwellings)								
	B. Number of Gas measures installed by participants	90,296	(Total number of dwellings)								
	C. Number of measures installed by Comp Group	na									
7. Market Segment Data											
	B. Distribution of participants by CEC Climate zone	See final page									

Table 6 - Whole Building, Page 1

M&E PROTOCOLS TABLE 6

Low Income Energy Efficiency Program

ENDUSE: Lighting
Designated Unit of Measurement: Bulb

1. Average Participant Group and Average Comaprison Group		Participant	Comparison								
A. Pre-install usage:	Pre-install kW	na	na								
	Pre-install kWh	na	na								
	Pre-install Therms	na	na								
	Base kW	na	na								
	Base kWh	na	na								
	Base Therms	na	na								
	Base kW/ designated unit of measurement	na	na								
	Base kWh/ designated unit of measurement	na	na								
	Base Therms/ designated unit of measurement	na	na								
B. Impact year usage:	Impact Yr kW	na	na								
	Impact Yr kWh	na	na								
	Impact Yr Therms	na	na								
	Impact Yr kW/designated unit	na	na								
	Impact Yr kWh/designated unit	na	na	5. A. 90% CONFIDENCE LEVEL				5. B. 80% CONFIDENCE LEVEL			
	Impact Yr Therms/designated unit	na	na	LOW BND	UP BND	LOW BND	UP BND	LOW BND	UP BND	LOW BND	UP BND
2. Average Net and Gross End Use Load Impacts		**AVG GROSS**	**AVG NET**	**AVG GROSS**	**AVG GROSS**	**AVG NET**	**AVG NET**	**AVG GROSS**	**AVG GROSS**	**AVG NET**	**AVG NET**
	A. i. Load Impacts - kW	na	na	na	na	na	na	na	na	na	na
	A. ii. Load Impacts - kWh	10,672,029	10,672,029	9,959,618	11,384,440	9,959,618	11,384,440	10,111,628	11,232,430	10,111,628	11,232,430
	A. iii. Load Impacts - Therms	na	na	na	na	na	na	na	na	na	na
	B. i. Load Impacts/designated unit - kW	na	na	na	na	na	na	na	na	na	na
	B. ii. Load Impacts/designated unit - kWh	20	20	18	21	18	21	19	21	19	21
	B. iii. Load Impacts/designated unit - Therms	na	na	na	na	na	na	na	na	na	na
	C. i. a. % change in usage - Part Grp - kW	na	na	na	na	na	na	na	na	na	na
	C. i. b. % change in usage - Part Grp - kWh	na	na	na	na	na	na	na	na	na	na
	C. i. c. % change in usage - Part Grp - Therms	na	na	na	na	na	na	na	na	na	na
	C. ii. a. % change in usage - Comp Grp - kW	na	na	na	na	na	na	na	na	na	na
	C. ii. b. % change in usage - Comp Grp - kWh	na	na	na	na	na	na	na	na	na	na
	C. ii. c. % change in usage - Comp Grp - Therms	na	na	na	na	na	na	na	na	na	na
D. Realization Rate:	D.A. i. Load Impacts - kW, realization rate	na	na	na	na	na	na	na	na	na	na
	D.A. ii. Load Impacts - kWh, realization rate	na	na	na	na	na	na	na	na	na	na
	D.A. iii. Load Impacts - Therms, realization rate	na	na	na	na	na	na	na	na	na	na
	D.B. i. Load Impacts/designated unit - kW, real rate	na	na	na	na	na	na	na	na	na	na
	D.B. ii. Load Impacts/designated unit - kWh, real rate	na	na	na	na	na	na	na	na	na	na
	D.B. iii. Load Impacts/designated unit - Therms, real rate	na	na	na	na	na	na	na	na	na	na
3. Net-to-Gross Ratios		**RATIO**		**RATIO**	**RATIO**			**RATIO**	**RATIO**		
	A. i. Average Load Impacts - kW	na		na	na			na	na		
	A. ii. Average Load Impacts - kWh	1.00		na	na			na	na		
	A. iii. Average Load Impacts - Therms	na		na	na			na	na		
	B. i. Avg Load Impacts/designated unit of measurement - kW	na		na	na			na	na		
	B. ii. Avg Load Impacts/designated unit of measurement - kWh	1.00		na	na			na	na		
	B. iii. Avg Load Impacts/designated unit of measurement - Therms	na		na	na			na	na		
	C. i. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - kW	na		na	na			na	na		
	C. ii. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - kWh	1.00		na	na			na	na		
	C. iii. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - Thms	na		na	na			na	na		
4. Designated Unit Intermediate Data		**PART GRP**	**NP GRP**					**PART GRP**	**PART GRP**		
	A. Pre-install average value	na	na					na	na		
	B. Post-install average value	na	na					na	na		
6. Measure Count Data		**NUMBER**									
	A. Number of Electric measures installed by participants	542,956	(Total number of bulbs)								
	A. Number of Gas measures installed by participants	na									
	C. Number of measures installed by Comp Group	na									
7. Market Segment Data											
	B. Distribution of participants by CEC Climate zone	See final page									

Table 6 - Lighting, Page 1

M&E PROTOCOLS TABLE 6

Low Income Energy Efficiency Program

ENDUSE: Refrigeration
Designated Unit of Measurement: Refrigerator

1. Average Participant Group and Average Comaprison Group		Participant	Comparison								
A. Pre-install usage:	Pre-install kW	na	na								
	Pre-install kWh	na	na								
	Pre-install Therms	na	na								
	Base kW	na	na								
	Base kWh	na	na								
	Base Therms	na	na								
	Base kW/ designated unit of measurement	na	na								
	Base kWh/ designated unit of measurement	na	na								
	Base Therms/ designated unit of measurement	na	na								
B. Impact year usage:	Impact Yr kW	na	na								
	Impact Yr kWh	na	na								
	Impact Yr Therms	na	na								
	Impact Yr kW/designated unit	na	na								
	Impact Yr kWh/designated unit	na	na	5. A. 90% CONFIDENCE LEVEL				5. B. 80% CONFIDENCE LEVEL			
	Impact Yr Therms/designated unit	na	na	LOW BND	UP BND	LOW BND	UP BND	LOW BND	UP BND	LOW BND	UP BND
2. Average Net and Gross End Use Load Impacts		**AVG GROSS**	**AVG NET**	**AVG GROSS**	**AVG GROSS**	**AVG NET**	**AVG NET**	**AVG GROSS**	**AVG GROSS**	**AVG NET**	**AVG NET**
	A. i. Load Impacts - kW	na	na	na	na	na	na	na	na	na	na
	A. ii. Load Impacts - kWh	17,951,706	17,951,706	17,650,864	18,252,549	17,650,864	18,252,549	17,715,056	18,188,357	17,715,056	18,188,357
	A. iii. Load Impacts - Therms	na	na	na	na	na	na	na	na	na	na
	B. i. Load Impacts/designated unit - kW	na	na	na	na	na	na	na	na	na	na
	B. ii. Load Impacts/designated unit - kWh	707	707	695	719	695	719	698	717	698	717
	B. iii. Load Impacts/designated unit - Therms	na	na	na	na	na	na	na	na	na	na
	C. i. a. % change in usage - Part Grp - kW	na	na	na	na	na	na	na	na	na	na
	C. i. b. % change in usage - Part Grp - kWh	na	na	na	na	na	na	na	na	na	na
	C. i. c. % change in usage - Part Grp - Therms	na	na	na	na	na	na	na	na	na	na
	C. ii. a. % change in usage - Comp Grp - kW	na	na	na	na	na	na	na	na	na	na
	C. ii. b. % change in usage - Comp Grp - kWh	na	na	na	na	na	na	na	na	na	na
	C. ii. c. % change in usage - Comp Grp - Therms	na	na	na	na	na	na	na	na	na	na
D. Realization Rate:	D.A. i. Load Impacts - kW, realization rate	na	na	na	na	na	na	na	na	na	na
	D.A. ii. Load Impacts - kWh, realization rate	na	na	na	na	na	na	na	na	na	na
	D.A. iii. Load Impacts - Therms, realization rate	na	na	na	na	na	na	na	na	na	na
	D.B. i. Load Impacts/designated unit - kW, real rate	na	na	na	na	na	na	na	na	na	na
	D.B. ii. Load Impacts/designated unit - kWh, real rate	na	na	na	na	na	na	na	na	na	na
	D.B. iii. Load Impacts/designated unit - Therms, real rate	na	na	na	na	na	na	na	na	na	na
3. Net-to-Gross Ratios		**RATIO**		**RATIO**	**RATIO**			**RATIO**	**RATIO**		
	A. i. Average Load Impacts - kW	na		na	na			na	na		
	A. ii. Average Load Impacts - kWh	1.00		na	na			na	na		
	A. iii. Average Load Impacts - Therms	na		na	na			na	na		
	B. i. Avg Load Impacts/designated unit of measurement - kW	na		na	na			na	na		
	B. ii. Avg Load Impacts/designated unit of measurement - kWh	1.00		na	na			na	na		
	B. iii. Avg Load Impacts/designated unit of measurement - Therms	na		na	na			na	na		
	C. i. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - kW	na		na	na			na	na		
	C. ii. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - kWh	1.00		na	na			na	na		
	C. iii. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - Thms	na		na	na			na	na		
4. Designated Unit Intermediate Data		**PART GRP**	**NP GRP**					**PART GRP**	**PART GRP**		
	A. Pre-install average value	na	na					na	na		
	B. Post-install average value	na	na					na	na		
6. Measure Count Data		**NUMBER**									
	A. Number of Electric measures installed by participants	25,381	(Total number of refrigerators)								
	A. Number of Gas measures installed by participants	na									
	C. Number of measures installed by Comp Group	na									
7. Market Segment Data											
	B. Distribution of participants by CEC Climate zone	See final page									

Table 6 - Refrigeration, Page 1

M&E PROTOCOLS TABLE 6

Low Income Energy Efficiency Program

ENDUSE: Air Conditioning
Designated Unit of Measurement: Dwelling/Measure

1. Average Participant Group and Average Comaprison Group		Participant	Comparison								
A. Pre-install usage:	Pre-install kW	na	na								
	Pre-install kWh	na	na								
	Pre-install Therms	na	na								
	Base kW	na	na								
	Base kWh	na	na								
	Base Therms	na	na								
	Base kW/ designated unit of measurement	na	na								
	Base kWh/ designated unit of measurement	na	na								
	Base Therms/ designated unit of measurement	na	na								
B. Impact year usage:	Impact Yr kW	na	na								
	Impact Yr kWh	na	na								
	Impact Yr Therms	na	na								
	Impact Yr kW/designated unit	na	na								
	Impact Yr kWh/designated unit	na	na	5. A. 90% CONFIDENCE LEVEL				5. B. 80% CONFIDENCE LEVEL			
	Impact Yr Therms/designated unit	na	na	LOW BND	UP BND	LOW BND	UP BND	LOW BND	UP BND	LOW BND	UP BND
2. Average Net and Gross End Use Load Impacts		AVG GROSS	AVG NET	AVG GROSS	AVG GROSS	AVG NET	AVG NET	AVG GROSS	AVG GROSS	AVG NET	AVG NET
	A. i. Load Impacts - kW	na	na	na	na	na	na	na	na	na	na
	A. ii. Load Impacts - kWh	3,293,848	3,293,848	3,087,594	3,499,448	3,087,594	3,499,448	3,131,533	3,455,509	3,131,533	3,455,509
	A. iii. Load Impacts - Therms	na	na	na	na	na	na	na	na	na	na
	B. i. Load Impacts/designated unit - kW	na	na	na	na	na	na	na	na	na	na
	B. ii. Load Impacts/designated unit - kWh	123	123	115	130	115	130	117	129	117	129
	B. iii. Load Impacts/designated unit - Therms	na	na	na	na	na	na	na	na	na	na
	C. i. a. % change in usage - Part Grp - kW	na	na	na	na	na	na	na	na	na	na
	C. i. b. % change in usage - Part Grp - kWh	na	na	na	na	na	na	na	na	na	na
	C. i. c. % change in usage - Part Grp - Therms	na	na	na	na	na	na	na	na	na	na
	C. ii. a. % change in usage - Comp Grp - kW	na	na	na	na	na	na	na	na	na	na
	C. ii. b. % change in usage - Comp Grp - kWh	na	na	na	na	na	na	na	na	na	na
	C. ii. c. % change in usage - Comp Grp - Therms	na	na	na	na	na	na	na	na	na	na
D. Realization Rate:	D.A. i. Load Impacts - kW, realization rate	na	na	na	na	na	na	na	na	na	na
	D.A. ii. Load Impacts - kWh, realization rate	na	na	na	na	na	na	na	na	na	na
	D.A. iii. Load Impacts - Therms, realization rate	na	na	na	na	na	na	na	na	na	na
	D.B. i. Load Impacts/designated unit - kW, real rate	na	na	na	na	na	na	na	na	na	na
	D.B. ii. Load Impacts/designated unit - kWh, real rate	na	na	na	na	na	na	na	na	na	na
	D.B. iii. Load Impacts/designated unit - Therms, real rate	na	na	na	na	na	na	na	na	na	na
3. Net-to-Gross Ratios		RATIO		RATIO	RATIO			RATIO	RATIO		
	A. i. Average Load Impacts - kW	na		na	na			na	na		
	A. ii. Average Load Impacts - kWh	1.00		na	na			na	na		
	A. iii. Average Load Impacts - Therms	na		na	na			na	na		
	B. i. Avg Load Impacts/designated unit of measurement - kW	na		na	na			na	na		
	B. ii. Avg Load Impacts/designated unit of measurement - kWh	1.00		na	na			na	na		
	B. iii. Avg Load Impacts/designated unit of measurement - Therms	na		na	na			na	na		
	C. i. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - kW	na		na	na			na	na		
	C. ii. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - kWh	1.00		na	na			na	na		
	C. iii. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - Thms	na		na	na			na	na		
4. Designated Unit Intermediate Data		PART GRP	NP GRP					PART GRP	PART GRP		
	A. Pre-install average value	na	na					na	na		
	B. Post-install average value	na	na					na	na		
6. Measure Count Data		NUMBER									
	A. Number of Electric measures installed by participants	26,871									
	A. Number of Gas measures installed by participants	na									
	C. Number of measures installed by Comp Group	na									
7. Market Segment Data											
	B. Distribution of participants by CEC Climate zone	See final page									

Table 6 - Air Conditioning, Page 1

M&E PROTOCOLS TABLE 6

Low Income Energy Efficiency Program

ENDUSE: Water Heating
Designated Unit of Measurement: Dwelling/Measure

1. Average Participant Group and Average Comaprison Group		Participant	Comparison								
A. Pre-install usage:	Pre-install kW	na	na								
	Pre-install kWh	na	na								
	Pre-install Therms	na	na								
	Base kW	na	na								
	Base kWh	na	na								
	Base Therms	na	na								
	Base kW/ designated unit of measurement	na	na								
	Base kWh/ designated unit of measurement	na	na								
	Base Therms/ designated unit of measurement	na	na								
B. Impact year usage:	Impact Yr kW	na	na								
	Impact Yr kWh	na	na								
	Impact Yr Therms	na	na								
	Impact Yr kW/designated unit	na	na								
	Impact Yr kWh/designated unit	na	na	5. A. 90% CONFIDENCE LEVEL				5. B. 80% CONFIDENCE LEVEL			
	Impact Yr Therms/designated unit	na	na	LOW BND	UP BND	LOW BND	UP BND	LOW BND	UP BND	LOW BND	UP BND
2. Average Net and Gross End Use Load Impacts		AVG GROSS	AVG NET	AVG GROSS	AVG GROSS	AVG NET	AVG NET	AVG GROSS	AVG GROSS	AVG NET	AVG NET
	A. i. Load Impacts - kW	na	na	na	na	na	na	na	na	na	na
	A. ii. Load Impacts - kWh	305,965	305,965	237,259	374,670	237,259	374,670	251,919	360,010	251,919	360,010
	A. iii. Load Impacts - Therms	841,585	841,585	791,717	891,453	791,717	891,453	802,357	880,812	802,357	880,812
	B. i. Load Impacts/designated unit - kW	na	na	na	na	na	na	na	na	na	na
	B. ii. Load Impacts/designated unit - kWh	61	61	47	74	47	74	50	71	50	71
	B. iii. Load Impacts/designated unit - Therms	6	6	6	6	6	6	6	6	6	6
	C. i. a. % change in usage - Part Grp - kW	na	na	na	na	na	na	na	na	na	na
	C. i. b. % change in usage - Part Grp - kWh	na	na	na	na	na	na	na	na	na	na
	C. i. c. % change in usage - Part Grp - Therms	na	na	na	na	na	na	na	na	na	na
	C. ii. a. % change in usage - Comp Grp - kW	na	na	na	na	na	na	na	na	na	na
	C. ii. b. % change in usage - Comp Grp - kWh	na	na	na	na	na	na	na	na	na	na
	C. ii. c. % change in usage - Comp Grp - Therms	na	na	na	na	na	na	na	na	na	na
D. Realization Rate:	D.A. i. Load Impacts - kW, realization rate	na	na	na	na	na	na	na	na	na	na
	D.A. ii. Load Impacts - kWh, realization rate	na	na	na	na	na	na	na	na	na	na
	D.A. iii. Load Impacts - Therms, realization rate	na	na	na	na	na	na	na	na	na	na
	D.B. i. Load Impacts/designated unit - kW, real rate	na	na	na	na	na	na	na	na	na	na
	D.B. ii. Load Impacts/designated unit - kWh, real rate	na	na	na	na	na	na	na	na	na	na
	D.B. iii. Load Impacts/designated unit - Therms, real rate	na	na	na	na	na	na	na	na	na	na
3. Net-to-Gross Ratios		RATIO		RATIO	RATIO			RATIO	RATIO		
	A. i. Average Load Impacts - kW	na		na	na			na	na		
	A. ii. Average Load Impacts - kWh	1.00		na	na			na	na		
	A. iii. Average Load Impacts - Therms	1.00		na	na			na	na		
	B. i. Avg Load Impacts/designated unit of measurement - kW	na		na	na			na	na		
	B. ii. Avg Load Impacts/designated unit of measurement - kWh	1.00		na	na			na	na		
	B. iii. Avg Load Impacts/designated unit of measurement - Therms	1.00		na	na			na	na		
	C. i. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - kW	na		na	na			na	na		
	C. ii. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - kWh	1.00		na	na			na	na		
	C. iii. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - Thms	1.00		na	na			na	na		
4. Designated Unit Intermediate Data		PART GRP	NP GRP					PART GRP	PART GRP		
	A. Pre-install average value	na	na					na	na		
	B. Post-install average value	na	na					na	na		
6. Measure Count Data		NUMBER									
	A. Number of Electric measures installed by participants	5,056									
	A. Number of Gas measures installed by participants	143,550									
	C. Number of measures installed by Comp Group	na									
7. Market Segment Data											
	B. Distribution of participants by CEC Climate zone	See final page									

Table 6 - Water Heating, Page 1

M&E PROTOCOLS TABLE 6

Low Income Energy Efficiency Program

ENDUSE: Space Heating
Designated Unit of Measurement: Dwelling/Measure

1. Average Participant Group and Average Comaprison Group		Participant	Comparison								
A. Pre-install usage:	Pre-install kW	na	na								
	Pre-install kWh	na	na								
	Pre-install Therms	na	na								
	Base kW	na	na								
	Base kWh	na	na								
	Base Therms	na	na								
	Base kW/ designated unit of measurement	na	na								
	Base kWh/ designated unit of measurement	na	na								
	Base Therms/ designated unit of measurement	na	na								
B. Impact year usage:	Impact Yr kW	na	na								
	Impact Yr kWh	na	na								
	Impact Yr Therms	na	na								
	Impact Yr kW/designated unit	na	na								
	Impact Yr kWh/designated unit	na	na	5. A. 90% CONFIDENCE LEVEL				5. B. 80% CONFIDENCE LEVEL			
	Impact Yr Therms/designated unit	na	na	LOW BND	UP BND	LOW BND	UP BND	LOW BND	UP BND	LOW BND	UP BND
2. Average Net and Gross End Use Load Impacts		**AVG GROSS**	**AVG NET**	**AVG GROSS**	**AVG GROSS**	**AVG NET**	**AVG NET**	**AVG GROSS**	**AVG GROSS**	**AVG NET**	**AVG NET**
	A. i. Load Impacts - kW	na	na	na	na	na	na	na	na	na	na
	A. ii. Load Impacts - kWh	254,761	254,761	218,863	290,305	218,863	290,305	226,485	282,683	226,485	282,683
	A. iii. Load Impacts - Therms	862,165	862,165	839,544	886,541	839,544	886,541	844,558	881,528	844,558	881,528
	B. i. Load Impacts/designated unit - kW	na	na	na	na	na	na	na	na	na	na
	B. ii. Load Impacts/designated unit - kWh	20	20	17	22	17	22	17	22	17	22
	B. iii. Load Impacts/designated unit - Therms	5	5	5	5	5	5	5	5	5	5
	C. i. a. % change in usage - Part Grp - kW	na	na	na	na	na	na	na	na	na	na
	C. i. b. % change in usage - Part Grp - kWh	na	na	na	na	na	na	na	na	na	na
	C. i. c. % change in usage - Part Grp - Therms	na	na	na	na	na	na	na	na	na	na
	C. ii. a. % change in usage - Comp Grp - kW	na	na	na	na	na	na	na	na	na	na
	C. ii. b. % change in usage - Comp Grp - kWh	na	na	na	na	na	na	na	na	na	na
	C. ii. c. % change in usage - Comp Grp - Therms	na	na	na	na	na	na	na	na	na	na
D. Realization Rate:	D.A. i. Load Impacts - kW, realization rate	na	na	na	na	na	na	na	na	na	na
	D.A. ii. Load Impacts - kWh, realization rate	na	na	na	na	na	na	na	na	na	na
	D.A. iii. Load Impacts - Therms, realization rate	na	na	na	na	na	na	na	na	na	na
	D.B. i. Load Impacts/designated unit - kW, real rate	na	na	na	na	na	na	na	na	na	na
	D.B. ii. Load Impacts/designated unit - kWh, real rate	na	na	na	na	na	na	na	na	na	na
	D.B. iii. Load Impacts/designated unit - Therms, real rate	na	na	na	na	na	na	na	na	na	na
3. Net-to-Gross Ratios		**RATIO**		**RATIO**	**RATIO**			**RATIO**	**RATIO**		
	A. i. Average Load Impacts - kW	na		na	na			na	na		
	A. ii. Average Load Impacts - kWh	1.00		na	na			na	na		
	A. iii. Average Load Impacts - Therms	1.00		na	na			na	na		
	B. i. Avg Load Impacts/designated unit of measurement - kW	na		na	na			na	na		
	B. ii. Avg Load Impacts/designated unit of measurement - kWh	1.00		na	na			na	na		
	B. iii. Avg Load Impacts/designated unit of measurement - Therms	1.00		na	na			na	na		
	C. i. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - kW	na		na	na			na	na		
	C. ii. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - kWh	1.00		na	na			na	na		
	C. iii. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - Thms	1.00		na	na			na	na		
4. Designated Unit Intermediate Data		**PART GRP**	**NP GRP**					**PART GRP**	**PART GRP**		
	A. Pre-install average value	na	na					na	na		
	B. Post-install average value	na	na					na	na		
6. Measure Count Data		**NUMBER**									
	A. Number of Electric measures installed by participants	13,063									
	A. Number of Gas measures installed by participants	178,020									
	C. Number of measures installed by Comp Group	na									
7. Market Segment Data											
	B. Distribution of participants by CEC Climate zone	See final page									

Table 6 - Space Heating, Page 1

Distribution of Customers by CEC Climate Zone

Climate Zone	Electric Customers	Gas Customers
1	0.2%	0.4%
2	0.8%	1.0%
3	4.7%	7.1%
4	2.2%	3.8%
5	0.2%	0.5%
6	11.5%	1.1%
7	7.4%	8.9%
8	25.0%	20.9%
9	12.3%	18.9%
10	11.7%	8.4%
11	1.8%	2.9%
12	3.9%	10.0%
13	12.1%	11.9%
14	3.2%	0.9%
15	2.7%	2.0%
16	0.3%	1.2%

A.2 TABLE 7

A.2.1 Overview Information

a. Study Title and Study ID Number

Study Title: *Impact Evaluation of the 2001 Statewide Low Income Energy Efficiency (LIEE) Program*

Study ID No: 577

b. Program, Program Year and Program Description

Program: Statewide LIEE Program

Program year: 2001

Program description: The Statewide LIEE Program provides assistance to low-income customer groups throughout the state. The assistance consists of free installation of energy-efficiency measures, energy education, and repair and/or replacement of space heating and evaporative cooling equipment. The program serves an important equity objective in assisting customers who are highly unlikely or unable to participate in other residential conservation programs because of income constraints. This program allows income-eligible customers to receive the benefits of energy conservation without the hardship of making cash investments.

c. End Uses Covered

Space cooling, space heating, water heating, lighting, refrigeration

d. Methods and Models Used

Billing analysis utilizing a pooled time-series/cross-sectional load impact regression model.

e. Participant and Comparison Group Definition

- Participant group: qualified low income customers who received program services during calendar year 2001 and had adequate billing data (and were individually-metered) to support a billing analysis.
- No comparison group

f. Analysis Sample Size

Electric Model	Participants
Number of Customers	106,798
Number of Installations	106,798
Number of Measures	525,402
Number of Observations	2,966,778

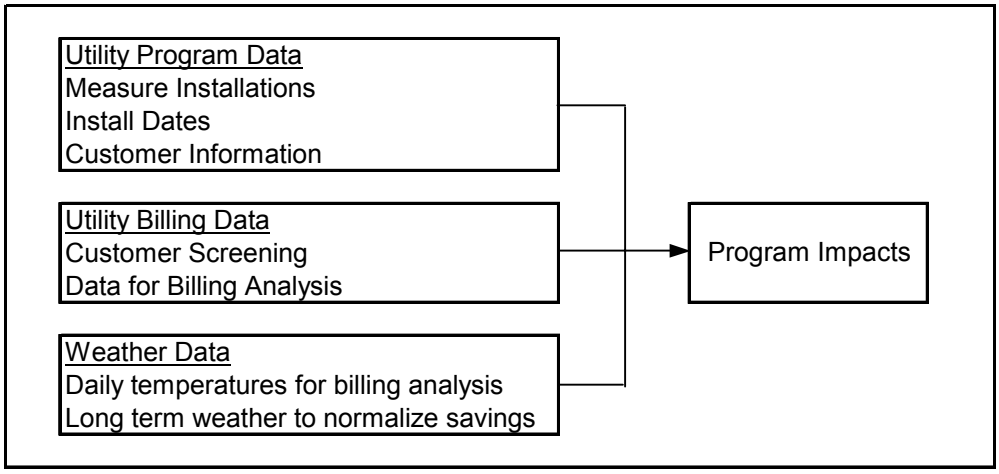
Gas Model	Participants
Number of Customers	54,637
Number of Installations	54,637
Number of Measures	211,628
Number of Observations	1,601,799

A.3 DATABASE MANAGEMENT

a. Flow Chart

The flow chart is presented in the following figure.

Data Flow Chart



b. Specific Data Sources

Program data: extracts from the program tacking system for PY2001 from SCE, PG&E, SDG&E, and SCG.

Billing data: billing system data for the period January 2000 through October 2001 from SCE, PG&E, SDG&E, and SCG.

Weather data: daily temperature data from 1990 on for multiple weather stations in the SCE, PG&E, SDG&E, and SCG service areas, as provided by the utilities.

c. Data Attrition

Data attrition is summarized in the following table.

Utility		Total Dwellings	Screened Dwellings
SCE	Participants	93,228	
SCE	Not Individually Metered	77,991	15,237
SCE	Extreme Usage Data	73,252	4,739
PG&E	Participants	38,068	
PG&E	Not Resclass 1 or 2	24,934	13,134
PG&E	Extreme Usage Data	22,179	2,755
SDG&E	Participants	21,331	
SDG&E	Not Individually Metered	12,393	8,938
SDG&E	Extreme Usage Data	11,367	1,026
SCG	Participants	36,477	
SCG	Not Individually Metered	29,425	7,052
SCG	Extreme Usage Data	28,656	769
Total	Participants	189,104	
Total	Not Individually Metered	144,743	44,361
Total	Extreme Usage Data	135,454	9,289

d. Data Quality

Utility tracking data contained information for Application Number and Account Number. Billing data were matched to the tracking data using the Account Number. Billing data also contained a weather station ID variable that was used to merge of the appropriate weather data. Samples for the surveys included the Application Number in order to merge survey data on to the tracking data.

e. Data Collected Specifically for the Analysis but not Used

Not applicable.

A.4 SAMPLING

a. Sampling Procedures and Protocols

- Sampling frame - Participating homes with active accounts and adequate billing data; thus, for billing analyses master meter customers and customers without sufficient billing histories were excluded.

b. Survey Information

Not applicable.

c. Statistical Descriptions

Descriptive statistics for key model variables are provided in the following tables.

Electric Model

Variable	N	Mean	Std Dev	Minimum	Maximum
kwh per day	2,966,778	12.31661	8.95720	2.00000	159.89655
New Evap Cool* Post * Cdd * Multiple Family	2,966,778	0.03103	0.67622	0.00000	30.82000
New Evap Cool * Cdd * Multiple Family	2,966,778	0.08255	1.09421	0.00000	32.80000
New Evap Cool* Post * Cdd	2,966,778	0.15542	1.45550	0.00000	30.82000
New Evap Cool * Cdd	2,966,778	0.35811	2.18417	0.00000	32.80000
Evap Cool Maintenance * Post * Cdd	2,966,778	0.04697	0.91807	0.00000	29.05000
Evap Cool Maintenance * Cdd	2,966,778	0.16284	1.68352	0.00000	31.51429
New Cac * Post * Cdd	2,966,778	0.02090	0.65028	0.00000	29.20000
New Cac * Cdd	2,966,778	0.05767	1.08583	0.00000	30.70000
New Rac * Post * Cdd	2,966,778	0.00610	0.32505	0.00000	27.01066
New Rac * Cdd	2,966,778	0.01955	0.57842	0.00000	30.07586
Eheat * Hdd	2,966,778	0.44038	2.14683	0.00000	43.02286
Eheat * Hdd * Multiple Family	2,966,778	0.30536	1.73764	0.00000	43.02286
Eheat * Hdd * Mobile Home	2,966,778	0.02218	0.52960	0.00000	30.71862
Eheat * Post * Hdd * Sum(Measure Savings)	2,966,778	50.92616	513.54273	0.00000	15620.00000
Eac * Cdd	2,966,778	0.62906	2.78279	0.00000	30.69444
Eac * Cdd * Multiple Family	2,966,778	0.35060	2.03936	0.00000	30.69444
Eac * Cdd * Mobile Home	2,966,778	0.06117	0.95675	0.00000	30.30690
Eac * Post * Cdd * Sum(Measure Savings)	2,966,778	4.72037	108.51048	0.00000	7698.58000
Ref * Post * (677/365)	2,966,778	0.09956	0.41471	0.00000	1.85479
Ref * Post * (677/365) * (Single Family = 0)	2,966,778	0.05491	0.31182	0.00000	1.85479
Post * (Cfl Number*(22/365) + Porch Number * (32/365))	2,966,778	0.10654	0.14903	0.00000	11.50685
Post * (Cfl Number*(22/365) + Porch Number * (32/365)) * (Single Family = 0)	2,966,778	0.06884	0.13152	0.00000	11.50685
Ewat * Post * Sum(Measure Savings)	2,966,778	1.19408	20.46933	0.00000	844.00000
Full Pre/Post Usage Group Indicator	2,966,778	0.80924	0.39290	0.00000	1.00000
Multiple Family Indicator	2,966,778	0.58506	0.49271	0.00000	1.00000
Mobile Home Indicator	2,966,778	0.04765	0.21302	0.00000	1.00000
Air Conditioner Indicator	2,966,778	0.22132	0.41514	0.00000	1.00000
Evaporative Cooler Indicator	2,966,778	0.06158	0.24040	0.00000	1.00000
Evaporative Cooler Maintenance Indicator	2,966,778	0.02185	0.14619	0.00000	1.00000
Electric Heat Indicator	2,966,778	0.08088	0.27265	0.00000	1.00000
Electric Water Heat Indicator	2,966,778	0.06148	0.24021	0.00000	1.00000
Refrigerator Replacement Indicator	2,966,778	0.14565	0.35275	0.00000	1.00000
Inside Relamping Indicator	2,966,778	0.81991	0.38426	0.00000	1.00000
Outside Relamping Indicator	2,966,778	0.44625	0.49710	0.00000	1.00000
Low Flow Showerhead Indicator	2,966,778	0.17292	0.37818	0.00000	1.00000
Water Heater Blanket Indicator	2,966,778	0.03098	0.17326	0.00000	1.00000
Pipe Insulation Indicator	2,966,778	0.00969	0.09797	0.00000	1.00000
Faucet Aerator Indicator	2,966,778	0.19975	0.39981	0.00000	1.00000
Ceiling Insulation Indicator	2,966,778	0.02050	0.14170	0.00000	1.00000
Caulking Indicator	2,966,778	0.19240	0.39419	0.00000	1.00000
Weather Stripping Indicator	2,966,778	0.18523	0.38849	0.00000	1.00000
Minor Building Repair Indicator	2,966,778	0.12701	0.33299	0.00000	1.00000
Duct Sealing Indicator	2,966,778	0.00161	0.04009	0.00000	1.00000
Evaporative Cooler Cover Indicator	2,966,778	0.01520	0.12235	0.00000	1.00000
Furnace Filter	2,966,778	0.07307	0.26026	0.00000	1.00000
Whole House Fan Indicator	2,966,778	0.00084	0.02898	0.00000	1.00000

Electric Model

Variable	N	Mean	Std Dev	Minimum	Maximum
Set Back Thermostat Indicator	2,966,778	0.00113	0.03353	0.00000	1.00000
Dummy variable, 1/2000	2,966,778	0.01954	0.13841	0.00000	1.00000
Dummy variable, 2/2000	2,966,778	0.02238	0.14792	0.00000	1.00000
Dummy variable, 3/2000	2,966,778	0.02596	0.15900	0.00000	1.00000
Dummy variable, 4/2000	2,966,778	0.02306	0.15010	0.00000	1.00000
Dummy variable, 5/2000	2,966,778	0.02562	0.15801	0.00000	1.00000
Dummy variable, 6/2000	2,966,778	0.02636	0.16019	0.00000	1.00000
Dummy variable, 7/2000	2,966,778	0.02442	0.15434	0.00000	1.00000
Dummy variable, 8/2000	2,966,778	0.02882	0.16729	0.00000	1.00000
Dummy variable, 9/2000	2,966,778	0.02592	0.15890	0.00000	1.00000
Dummy variable, 10/2000	2,966,778	0.02766	0.16398	0.00000	1.00000
Dummy variable, 11/2000	2,966,778	0.02709	0.16235	0.00000	1.00000
Dummy variable, 12/2000	2,966,778	0.02820	0.16554	0.00000	1.00000
Dummy variable, 1/2001	2,966,778	0.03084	0.17289	0.00000	1.00000
Dummy variable, 2/2001	2,966,778	0.02714	0.16249	0.00000	1.00000
Dummy variable, 3/2001	2,966,778	0.03199	0.17598	0.00000	1.00000
Dummy variable, 4/2001	2,966,778	0.03155	0.17481	0.00000	1.00000
Dummy variable, 5/2001	2,966,778	0.03237	0.17697	0.00000	1.00000
Dummy variable, 6/2001	2,966,778	0.03286	0.17826	0.00000	1.00000
Dummy variable, 7/2001	2,966,778	0.03262	0.17763	0.00000	1.00000
Dummy variable, 8/2001	2,966,778	0.03591	0.18606	0.00000	1.00000
Dummy variable, 9/2001	2,966,778	0.03056	0.17212	0.00000	1.00000
Dummy variable, 10/2001	2,966,778	0.03505	0.18389	0.00000	1.00000
Dummy variable, 11/2001	2,966,778	0.03197	0.17592	0.00000	1.00000
Dummy variable, 12/2001	2,966,778	0.03185	0.17559	0.00000	1.00000
Dummy variable, 1/2002	2,966,778	0.03470	0.18301	0.00000	1.00000
Dummy variable, 2/2002	2,966,778	0.03015	0.17101	0.00000	1.00000
Dummy variable, 3/2002	2,966,778	0.03309	0.17888	0.00000	1.00000
Dummy variable, 4/2002	2,966,778	0.03391	0.18101	0.00000	1.00000
Dummy variable, 5/2002	2,966,778	0.03357	0.18011	0.00000	1.00000
Dummy variable, 6/2002	2,966,778	0.03035	0.17156	0.00000	1.00000
Dummy variable, 7/2002	2,966,778	0.03314	0.17901	0.00000	1.00000
Dummy variable, 8/2002	2,966,778	0.03252	0.17737	0.00000	1.00000
Dummy variable, 9/2002	2,966,778	0.02917	0.16827	0.00000	1.00000

Gas Model

Variable	N	Mean	Std Dev	Minimum	Maximum
Therms Per Day	1,601,799	1.10129	0.93658	0.10000	14.89655
Gheat * Hdd	1,601,799	3.91173	5.01364	0.00000	32.72414
Gheat * Hdd * Multiple Family	1,601,799	1.42559	3.48192	0.00000	32.27586
Gheat * Hdd * Mobile Home	1,601,799	0.27367	1.74375	0.00000	31.09375
Gheat * Post * Hdd * Sum(Measure Savings)	1,601,799	228.52258	435.52981	0.00000	3905.38000
Ht Replace * Post * Hdd * (Inop=0)	1,601,799	0.04222	0.61154	0.00000	31.36667
Ht Replace * Hdd * (Inop = 0)	1,601,799	0.10493	0.96908	0.00000	31.36667
Ht Replace * Post * Hdd * Inop	1,601,799	0.02867	0.50436	0.00000	30.93333
Ht Repair * Hdd * (Inop = 0)	1,601,799	0.02558	0.51422	0.00000	22.48276
Ht Repair * Hdd * Post * (Inop=0)	1,601,799	0.06676	0.82834	0.00000	22.48276
Ht Repair * Hdd * Post * Inop	1,601,799	0.01205	0.35870	0.00000	22.78571
Gwat * Post * Sum(Measure Savings)	1,601,799	7.38929	11.99860	0.00000	54.00000
Wh Replace * Post	1,601,799	0.00972	0.09736	0.00000	1.00000
Wh Replace * Post * Multiple Family	1,601,799	0.00202	0.04456	0.00000	1.00000
Full Pre/Post Usage Group Indicator	1,601,799	0.86612	0.34052	0.00000	1.00000
Multiple Family Indicator	1,601,799	0.36856	0.48241	0.00000	1.00000
Mobile Home Indicator	1,601,799	0.05810	0.23393	0.00000	1.00000
Gas Space Heat Indicator	1,601,799	0.90819	0.28876	0.00000	1.00000
Gas Water Heat Indicator	1,601,799	0.89995	0.30007	0.00000	1.00000
Furnace Repair Indicator	1,601,799	0.02052	0.14176	0.00000	1.00000
Furnace Replace Indicator	1,601,799	0.04480	0.20687	0.00000	1.00000
Wh Replace Indicator	1,601,799	0.03349	0.17991	0.00000	1.00000
Low Flow Showerhead Indicator	1,601,799	0.80320	0.59030	0.00000	4.00000
Water Heater Blanket Indicator	1,601,799	0.13362	0.34024	0.00000	1.00000
Pipe Insulation Indicator	1,601,799	0.03683	0.18833	0.00000	1.00000
Faucet Aerator Indicator	1,601,799	0.78570	0.41033	0.00000	1.00000
Ceiling Insulation Indicator	1,601,799	0.07400	0.26178	0.00000	1.00000
Caulking Indicator	1,601,799	0.34180	0.47431	0.00000	1.00000
Weather Stripping Indicator	1,601,799	0.76955	0.42112	0.00000	1.00000
Minor Building Repair Indicator	1,601,799	0.66376	0.47242	0.00000	1.00000
Duct Sealing Indicator	1,601,799	0.00447	0.06669	0.00000	1.00000
Evaporative Cooler Cover Indicator	1,601,799	0.04146	0.19935	0.00000	1.00000
Furnace Filter Indicator	1,601,799	0.14161	0.34864	0.00000	1.00000
Set Back Thermostat Indicator	1,601,799	0.00153	0.03911	0.00000	1.00000

A.5 DATA SCREENING AND ANALYSIS

A. Outliers: customers with very large bills (monthly electric use over 3,500 kWh and monthly gas use over 450 therms) and electric customers with very small bills (avergage monthly usage under 50 kWh) were not included in the analysis; no other outliers were eliminated.
Missing data: not a problem.
Weather adjustment: weather variables were included in regression models; savings were based on average weather.

B. Background variables: site-specific and monthly variables were included to account for non-program effects.

C. Data screening: See Item B3 above for the sample attrition; all sites with adequate billing data were included in models.
D. Regression statistics: statistics are provided in the following tables.

Electric Model, All Available Participants – Dependent Variable: Monthly kWh per Day

Variable	Parameter estimate	t-statistic
Evaporative cooling * CDD	0.841806	397.43
Evaporative cooling * CDD * multifamily	-0.176797	-67.58
Evaporative cooling* CDD * POST	-0.191048	-46.75
Evaporative cooling* CDD * POST * multifamily	0.124771	23.58
Evaporative cooler maintenance * CDD	0.696858	315.29
Evaporative cooler maintenance * CDD * POST	-0.027718	-8.96
CAC * CDD	0.609481	168.49
CAC * CDD * POST	-0.145554	-31.23
RAC * CDD	0.354896	54.26
RAC * CDD * POST	-0.113246	-12.68
AC * CDD	1.082334	550.26
AC * CDD * multifamily	-0.182970	-73.26
AC * CDD * mobile home	-0.120480	-30.36
AC * CDD * POST * weatherization savings	-0.000263	-10.30
Electric heating * HDD	0.767708	79.74
Electric heating * HDD * multifamily	-0.180066	-18.78
Electric heating * HDD * mobile home	-0.163897	-14.64
Electric heating * HDD * POST * weatherization savings	-0.000255	-11.72
Refrigerator * POST * refrigerator savings	-1.173974	-103.31
Refrigerator * POST * refrigerator savings * non-single family	0.191576	12.86
POST * (number of CFLs distributed* CFL savings + number of porch lights distributed * porch light savings)	-1.081401	-27.32
POST * (number of CFLs distributed* CFL savings + number of porch lights distributed * porch light savings) * non-single family	0.330423	8.56
Electric water heat * POST * sum(measure savings)	-0.001154	-7.32
Customer fixed effects		F=97.98
Dummy variable, 1/2000	0.549545	23.19
Dummy variable, 2/2000	-0.102284	-4.45
Dummy variable, 3/2000	-0.286156	-12.87
Dummy variable, 4/2000	-1.100962	-48.24
Dummy variable, 5/2000	-1.129092	-50.64
Dummy variable, 6/2000	-0.370427	-16.66
Dummy variable, 7/2000	0.420754	18.57
Dummy variable, 8/2000	1.246256	56.67
Dummy variable, 9/2000	0.299311	13.39
Dummy variable, 10/2000	-0.254925	-11.59
Dummy variable, 11/2000	-0.325097	-14.74
Dummy variable, 12/2000	0.541002	24.72
Dummy variable, 1/2001	0.593620	27.59
Dummy variable, 2/2001	0.098548	4.46
Dummy variable, 3/2001	-0.327675	-15.34
Dummy variable, 4/2001	-1.365367	-63.80
Dummy variable, 5/2001	-1.571376	-73.70
Dummy variable, 6/2001	-1.100703	-51.50
Dummy variable, 7/2001	-0.244811	-11.37
Dummy variable, 8/2001	0.071439	3.36
Dummy variable, 9/2001	0.073697	3.35
Dummy variable, 10/2001	-0.614772	-28.48
Dummy variable, 11/2001	-0.781596	-35.40
Dummy variable, 12/2001	0.347929	15.60
Dummy variable, 1/2002	0.827494	37.30
Dummy variable, 2/2002	0.358887	15.76
Dummy variable, 3/2002	-0.580790	-25.94
Dummy variable, 4/2002	-0.945365	-42.40
Dummy variable, 5/2002	-1.222011	-54.66
Dummy variable, 6/2002	-0.734951	-32.23
Dummy variable, 7/2002	0.416644	18.43
Dummy variable, 8/2002	0.893066	39.36
Dummy variable, 9/2002	0.439902	19.07
R^2	0.8053	
Number of observations	2,966,778	

Natural Gas Model, All Available Participants
Dependent Variable: Monthly Therms per Day

Variable	Parameter estimate	t-statistic
Gas heating * HDD	0.144218	455.53
Gas heating * HDD * multifamily	-0.092786	-276.49
Gas heating * HDD * mobilehome	-0.002264	-5.24
Furnace replace * HDD * operable furnace	0.169682	261.13
Furnace replace * HDD * POST * operable furnace	-0.026833	-31.88
Furnace replace * HDD * POST * inoperable furnace	0.130286	149.87
Furnace repair * HDD * operable furnace	0.122772	162.38
Furnace repair * HDD * POST * operable furnace	-0.017870	-18.13
Furnace repair * HDD * POST * inoperable furnace	0.105049	86.80
Gas heating * HDD * POST * weatherization savings	-0.000194	-64.26
Gas water heating * HDD * POST * water heating savings	-0.001406	-34.39
Water heater * POST	-0.052177	-9.27
Water heater * POST * multifamily	0.026249	2.08
Customer fixed effects		F=46.46
R^2	0.7328	
Number of observations	1,601,799	

E. Specification: Regression models are discussed fully in Section 3.2 of the Report.
   a. Customer-specific intercept terms were used to account for cross-sectional variation.
   b. Monthly dummy variables and site-specific nonprogram variables were included to account for time series variation.
   c. na
   d. na
   e. na - model provides gross impacts; net impacts were assumed to equal gross impacts.

F. Error in measuring variables: na

G. Autocorrelation: monthly dummy variables were included in the electric model to minimize autocorrelation.

H. Heteroskedasticity: customer-specific intercept terms were included to mitigate heteroskedasticity.

I. Collinearity: correlations among variables were reviewed; collinearity was not otherwise treated.

J. Influential data points: not considered a problem with the large numbers of observations in the studies; no outliers were removed.

K. Missing data: na

L. Precision: The standard error of the regression parameters were utilized.

M. Engineering analysis: na

N. Net-to-gross: na

A.6 DATA INTERPRETATION AND APPLICATION

a. Net Impacts

Using the default assumption, net impacts were set equal to gross impacts.

b. Rationale

The M&E Protocols do not require a comparison group or net-to-gross analysis for the low income programs. The default assumption is that the program net-to-gross ratio is 1.0 and net impacts are equal to gross impacts.

B

IMPACT DETAIL

This appendix provides measure counts, unit impacts, and total impacts by utility, measure type, dwelling type and climate zone for weather-sensitive measures. Results are shown in the following order:

- PG&E weather sensitive measures (Table B-1)
- SCE weather sensitive measures (Table B-2)
- SoCalGas weather sensitive measures (Table B-3)
- SDG&E weather sensitive measures (Table B-4)

Table B-1
PG&E Weather Sensitive Impact by Climate Zone

Measure	Dwel Type	Clim Zone	Unit Savings			Units Installed			Total kWh		Total Thm
			Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH
Attic Insulation	MF	1									
Attic Insulation	MF	2			45.0			2			90
Attic Insulation	MF	3	305.5		39.4	1		52	306		2,049
Attic Insulation	MF	4			33.5			72			2,412
Attic Insulation	MF	5									
Attic Insulation	MF	11		129.7	42.1		5	21		649	884
Attic Insulation	MF	12	281.6	112.8	35.0	3	3	58	845	338	2,030
Attic Insulation	MF	13	252.3	198.8	31.4	4	66	151	1,009	13,121	4,741
Attic Insulation	MF	16			38.4			1			38
Attic Insulation	SF	1			75.2			2			150
Attic Insulation	SF	2	319.2	49.9	52.9	22	1	17	7,022	50	899
Attic Insulation	SF	3	295.6	25.7	44.4	9	1	425	2,660	26	18,870
Attic Insulation	SF	4	230.6	33.6	40.5	4	6	432	922	202	17,496
Attic Insulation	SF	5									
Attic Insulation	SF	11	284.1	105.8	47.0	26	34	130	7,387	3,597	6,110
Attic Insulation	SF	12	300.0	87.6	42.6	12	59	459	3,600	5,168	19,553
Attic Insulation	SF	13	220.1	249.9	38.2	22	283	723	4,842	70,722	27,619
Attic Insulation	SF	16	366.5		45.2	4		3	1,466		136
Caulking	MF	1	19.3		2.4	1		41	19		98
Caulking	MF	2	13.6	0.6	1.7	198	43	364	2,693	26	619
Caulking	MF	3	11.5	0.3	1.5	600	120	1,589	6,900	36	2,384
Caulking	MF	4	10.6	0.6	1.3	164	33	784	1,738	20	1,019
Caulking	MF	5	12.3		1.5	10			123		
Caulking	MF	11	12.7	1.6	1.5	60	99	485	762	158	728
Caulking	MF	12	11.8	1.4	1.4	393	316	2,698	4,637	442	3,777
Caulking	MF	13	10.0	2.5	1.4	219	759	2,028	2,190	1,898	2,839
Caulking	MF	16	16.7	1.0	1.4	86	1	10	1,436	1	14
Caulking	MH	1	19.5	0.0	2.4	2	1	61	39	0	146
Caulking	MH	2	14.7	0.8	2.5	30	11	213	441	9	533
Caulking	MH	3	11.1	0.8	1.3	5	2	183	56	2	238
Caulking	MH	4	10.5	0.5	1.3	2	4	138	21	2	179
Caulking	MH	5			1.5			1			2
Caulking	MH	11	12.1	1.9	1.4	68	131	613	823	249	858
Caulking	MH	12	12.5	1.6	2.1	34	158	1,276	425	253	2,680
Caulking	MH	13	9.9	2.5	2.0	8	105	311	79	263	622
Caulking	MH	16	14.6	1.5	1.4	24	1	17	350	2	24
Caulking	SF	1	28.8	0.0	4.7	16	2	49	461	0	230
Caulking	SF	2	21.6	2.1	3.3	156	25	123	3,370	53	406
Caulking	SF	3	17.9	1.1	3.5	33	20	1,650	591	22	5,775
Caulking	SF	4	16.1	1.4	3.3	21	33	979	338	46	3,231
Caulking	SF	5	17.7		3.6	4		1	71		4
Caulking	SF	11	18.8	4.4	4.2	181	285	932	3,403	1,254	3,914
Caulking	SF	12	20.1	3.9	4.3	107	560	3,028	2,151	2,184	13,020
Caulking	SF	13	14.8	6.2	3.7	106	1,337	3,019	1,569	8,289	11,170
Caulking	SF	16	21.8	5.2	2.9	43	2	28	937	10	81
Central AC	MF	1									
Central AC	MF	2									
Central AC	MF	3									
Central AC	MF	4									
Central AC	MF	5									
Central AC	MF	11									
Central AC	MF	12		122.2			5			611	
Central AC	MF	13		340.6			2			681	
Central AC	MF	16									
Central AC	MH	1									
Central AC	MH	2									
Central AC	MH	3									
Central AC	MH	4									
Central AC	MH	5									

Table B-1
PG&E Weather Sensitive Impact by Climate Zone

Measure	Dwel Type	Clim Zone	Unit Savings			Units Installed			Total kWh		Total Thm
			Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH
Central AC	MH	11		235.7			7			1,650	
Central AC	MH	12		217.5			45			9,788	
Central AC	MH	13		347.9			2			696	
Central AC	MH	16									
Central AC	SF	1									
Central AC	SF	2									
Central AC	SF	3		17.2			1			17	
Central AC	SF	4									
Central AC	SF	5									
Central AC	SF	11		233.0			21			4,893	
Central AC	SF	12		205.4			31			6,367	
Central AC	SF	13		342.1			20			6,842	
Central AC	SF	16									
Duct Sealing	MF	1									
Duct Sealing	MF	2									
Duct Sealing	MF	3			0.9			1			1
Duct Sealing	MF	4									
Duct Sealing	MF	5									
Duct Sealing	MF	11									
Duct Sealing	MF	12		22.4	1.5		1	21		22	32
Duct Sealing	MF	13	5.2	34.6	0.8	2	15	26	10	519	21
Duct Sealing	MF	16									
Duct Sealing	MH	12			15.2			4			61
Duct Sealing	SF	1									
Duct Sealing	SF	2			14.5			1			15
Duct Sealing	SF	3			15.4			6			92
Duct Sealing	SF	4			16.0			9			144
Duct Sealing	SF	5									
Duct Sealing	SF	11			15.1			3			45
Duct Sealing	SF	12	97.9	30.5	15.2	4	23	152	392	702	2,310
Duct Sealing	SF	13	73.5	46.8	12.9	1	50	74	74	2,340	955
Duct Sealing	SF	16									
Evaporative Cooler Cover	MF	1									
Evaporative Cooler Cover	MF	2	7.7		1.2	2		1	15		1
Evaporative Cooler Cover	MF	3			0.9			1			1
Evaporative Cooler Cover	MF	4	5.4		0.8	1		1	5		1
Evaporative Cooler Cover	MF	5									
Evaporative Cooler Cover	MF	11	6.3		1.0	1		35	6		35
Evaporative Cooler Cover	MF	12	6.5		0.9	10		50	65		45
Evaporative Cooler Cover	MF	13	5.1		0.8	9		81	46		65
Evaporative Cooler Cover	MF	16			0.9			1			1
Evaporative Cooler Cover	MH	1			1.1			1			1
Evaporative Cooler Cover	MH	2	7.7		1.1	13		115	100		127
Evaporative Cooler Cover	MH	3	5.9			1			6		
Evaporative Cooler Cover	MH	4			0.8			7			6
Evaporative Cooler Cover	MH	5									
Evaporative Cooler Cover	MH	11	6.3		1.0	18		317	113		317
Evaporative Cooler Cover	MH	12	6.5		0.9	2		395	13		356
Evaporative Cooler Cover	MH	13	5.1		0.8	1		542	5		434
Evaporative Cooler Cover	MH	16			0.9			8			7
Evaporative Cooler Cover	SF	1									
Evaporative Cooler Cover	SF	2	10.8		1.8	12		5	130		9
Evaporative Cooler Cover	SF	3									
Evaporative Cooler Cover	SF	4									
Evaporative Cooler Cover	SF	5									
Evaporative Cooler Cover	SF	11	9.1		3.3	12		143	109		472
Evaporative Cooler Cover	SF	12	9.8		3.8	5		280	49		1,064
Evaporative Cooler Cover	SF	13	7.4		3.1	7		615	52		1,907
Evaporative Cooler Cover	SF	16			1.4			4			6
Evaporative Cooler Installation	MF	1									
Evaporative Cooler Installation	MF	2									

Table B-1
PG&E Weather Sensitive Impact by Climate Zone

Measure	Dwel Type	Clim Zone	Unit Savings			Units Installed			Total kWh		Total Thm
			Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH
Evaporative Cooler Installation	MF	3									
Evaporative Cooler Installation	MF	4									
Evaporative Cooler Installation	MF	5									
Evaporative Cooler Installation	MF	11		85.0			153			13,005	
Evaporative Cooler Installation	MF	12		75.8			678			51,392	
Evaporative Cooler Installation	MF	13		122.0			709			86,498	
Evaporative Cooler Installation	MF	16									
Evaporative Cooler Installation	MH	1									
Evaporative Cooler Installation	MH	2									
Evaporative Cooler Installation	MH	3									
Evaporative Cooler Installation	MH	4									
Evaporative Cooler Installation	MH	5									
Evaporative Cooler Installation	MH	11		291.4			151			44,001	
Evaporative Cooler Installation	MH	12		267.7			387			103,600	
Evaporative Cooler Installation	MH	13		405.8			98			39,768	
Evaporative Cooler Installation	MH	16		288.0			1			288	
Evaporative Cooler Installation	SF	1									
Evaporative Cooler Installation	SF	2									
Evaporative Cooler Installation	SF	3		70.2			3			211	
Evaporative Cooler Installation	SF	4									
Evaporative Cooler Installation	SF	5									
Evaporative Cooler Installation	SF	11		277.1			282			78,142	
Evaporative Cooler Installation	SF	12		267.4			717			191,726	
Evaporative Cooler Installation	SF	13		413.4			1,252			517,577	
Evaporative Cooler Installation	SF	16		311.9			6			1,871	
Evaporative Cooler Maintenance	MF	1									
Evaporative Cooler Maintenance	MF	2									
Evaporative Cooler Maintenance	MF	3									
Evaporative Cooler Maintenance	MF	4									
Evaporative Cooler Maintenance	MF	5									
Evaporative Cooler Maintenance	MF	11		35.1			2			70	
Evaporative Cooler Maintenance	MF	12		28.4			1			28	
Evaporative Cooler Maintenance	MF	13		53.0			8			424	
Evaporative Cooler Maintenance	MF	16									
Evaporative Cooler Maintenance	MH	1									
Evaporative Cooler Maintenance	MH	2									
Evaporative Cooler Maintenance	MH	3									
Evaporative Cooler Maintenance	MH	4									
Evaporative Cooler Maintenance	MH	5									
Evaporative Cooler Maintenance	MH	11		41.1			2			82	
Evaporative Cooler Maintenance	MH	12									
Evaporative Cooler Maintenance	MH	13		66.2			2			132	
Evaporative Cooler Maintenance	MH	16		33.8			2			68	
Evaporative Cooler Maintenance	SF	1									
Evaporative Cooler Maintenance	SF	2		14.4			1			14	
Evaporative Cooler Maintenance	SF	3									
Evaporative Cooler Maintenance	SF	4									
Evaporative Cooler Maintenance	SF	5									
Evaporative Cooler Maintenance	SF	11		41.1			4			164	
Evaporative Cooler Maintenance	SF	12		37.1			8			297	
Evaporative Cooler Maintenance	SF	13		66.2			75			4,961	
Evaporative Cooler Maintenance	SF	16									
Furnace Filters	MF	1	19.2		2.4	1		8	19		19
Furnace Filters	MF	2	14.3		1.6	19		74	272		118
Furnace Filters	MF	3	11.1		1.4	4		296	44		414
Furnace Filters	MF	4	10.5		1.3	1		239	11		311
Furnace Filters	MF	5									
Furnace Filters	MF	11	12.4		1.4	20		272	248		381
Furnace Filters	MF	12	11.2		1.6	161		1,264	1,803		2,022
Furnace Filters	MF	13	10.0		1.2	143		2,275	1,430		2,730
Furnace Filters	MF	16									

Table B-1
PG&E Weather Sensitive Impact by Climate Zone

Measure	Dwel Type	Clim Zone	Unit Savings			Units Installed			Total kWh		Total Thm
			Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH
Furnace Filters	MH	1			2.4			52			125
Furnace Filters	MH	2	14.7		3.0	21		112	309		336
Furnace Filters	MH	3	10.8		1.3	1		163	11		212
Furnace Filters	MH	4	10.5		1.3	1		118	11		153
Furnace Filters	MH	5									
Furnace Filters	MH	11	12.1		1.4	44		487	532		682
Furnace Filters	MH	12	11.8		2.2	28		1,005	330		2,211
Furnace Filters	MH	13	10.0		2.2	6		315	60		693
Furnace Filters	MH	16	14.6		1.4	18		15	263		21
Furnace Filters	SF	1	28.8		4.7	4		11	115		52
Furnace Filters	SF	2	21.5		3.3	31		48	667		158
Furnace Filters	SF	3	16.5		3.5	5		623	83		2,181
Furnace Filters	SF	4	15.4		2.7	3		626	46		1,690
Furnace Filters	SF	5									
Furnace Filters	SF	11	18.7		3.5	53		391	991		1,369
Furnace Filters	SF	12	20.0		4.5	47		1,779	940		8,006
Furnace Filters	SF	13	14.8		3.6	110		2,205	1,628		7,938
Furnace Filters	SF	16	18.8		2.9	15		15	282		44
Furnace Repair	MF	1									
Furnace Repair	MF	2									
Furnace Repair	MF	3			41.2			4			165
Furnace Repair	MF	4									
Furnace Repair	MF	5									
Furnace Repair	MF	11									
Furnace Repair	MF	12			40.7			11			448
Furnace Repair	MF	13			36.5			5			183
Furnace Repair	MF	16									
Furnace Repair	MH	1									
Furnace Repair	MH	2			51.7			3			155
Furnace Repair	MH	3			41.2			1			41
Furnace Repair	MH	4			39.2			1			39
Furnace Repair	MH	5									
Furnace Repair	MH	11			44.4			10			444
Furnace Repair	MH	12			40.7			49			1,994
Furnace Repair	MH	13			36.5			13			475
Furnace Repair	MH	16			35.6			1			36
Furnace Repair	SF	1									
Furnace Repair	SF	2			51.7			2			103
Furnace Repair	SF	3			41.2			55			2,266
Furnace Repair	SF	4			39.2			39			1,529
Furnace Repair	SF	5									
Furnace Repair	SF	11			44.4			16			710
Furnace Repair	SF	12			40.7			180			7,326
Furnace Repair	SF	13			36.5			216			7,884
Furnace Repair	SF	16			35.6			2			71
Furnace Replacement	MF	1									
Furnace Replacement	MF	2			73.8			1			74
Furnace Replacement	MF	3									
Furnace Replacement	MF	4									
Furnace Replacement	MF	5									
Furnace Replacement	MF	11									
Furnace Replacement	MF	12			61.1			2			122
Furnace Replacement	MF	13			54.8			3			164
Furnace Replacement	MF	16									
Furnace Replacement	MH	1									
Furnace Replacement	MH	2			73.8			1			74
Furnace Replacement	MH	3			69.7			2			139
Furnace Replacement	MH	4			58.2			1			58
Furnace Replacement	MH	5									
Furnace Replacement	MH	11			66.9			2			134
Furnace Replacement	MH	12			61.1			18			1,100

Table B-1
PG&E Weather Sensitive Impact by Climate Zone

Measure	Dwel Type	Clim Zone	Unit Savings			Units Installed			Total kWh		Total Thm
			Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH
Furnace Replacement	MH	13			54.8			1			55
Furnace Replacement	MH	16									
Furnace Replacement	SF	1									
Furnace Replacement	SF	2			73.8			2			148
Furnace Replacement	SF	3			69.7			15			1,046
Furnace Replacement	SF	4			58.2			1			58
Furnace Replacement	SF	5									
Furnace Replacement	SF	11			66.9			16			1,070
Furnace Replacement	SF	12			61.1			35			2,139
Furnace Replacement	SF	13			54.8			32			1,754
Furnace Replacement	SF	16									
Minor Home Repair	MF	1			6.3			32			202
Minor Home Repair	MF	2	34.5	3.4	4.5	119	33	254	4,106	112	1,143
Minor Home Repair	MF	3	39.4	1.5	3.9	160	75	876	6,304	113	3,416
Minor Home Repair	MF	4	26.9	3.6	3.4	66	23	555	1,775	83	1,887
Minor Home Repair	MF	5	31.9			6			191		
Minor Home Repair	MF	11	31.8	9.8	3.9	37	58	303	1,177	568	1,182
Minor Home Repair	MF	12	28.9	9.0	3.7	142	184	1,471	4,104	1,656	5,443
Minor Home Repair	MF	13	25.2	14.8	3.4	165	672	1,824	4,158	9,946	6,202
Minor Home Repair	MF	16	42.2		3.8	24		5	1,013		19
Minor Home Repair	MH	1	49.3		6.3	2		52	99		328
Minor Home Repair	MH	2	37.1	5.0	4.6	25	6	170	928	30	782
Minor Home Repair	MH	3	28.1		3.6	1		84	28		302
Minor Home Repair	MH	4	26.5	3.2	3.4	1	3	84	27	10	286
Minor Home Repair	MH	5			3.9			1			4
Minor Home Repair	MH	11	30.8	11.0	3.8	44	75	364	1,355	825	1,383
Minor Home Repair	MH	12	32.2	9.4	4.5	24	80	721	773	752	3,245
Minor Home Repair	MH	13	24.9	14.9	4.2	6	77	242	149	1,147	1,016
Minor Home Repair	MH	16	37.8		3.8	14		12	529		46
Minor Home Repair	SF	1	71.9	0.0	12.5	13	1	40	935	0	500
Minor Home Repair	SF	2	53.9	6.1	9.4	147	19	117	7,923	116	1,100
Minor Home Repair	SF	3	45.6	3.2	8.2	26	21	1,343	1,186	67	11,013
Minor Home Repair	SF	4	40.7	4.1	7.5	17	29	871	692	119	6,533
Minor Home Repair	SF	5	44.7		8.2	3		1	134		8
Minor Home Repair	SF	11	47.1	12.8	9.0	154	208	743	7,253	2,662	6,687
Minor Home Repair	SF	12	49.6	11.2	8.7	81	396	2,393	4,018	4,435	20,819
Minor Home Repair	SF	13	37.0	17.9	7.6	98	1,284	2,943	3,626	22,984	22,367
Minor Home Repair	SF	16	54.3	14.9	7.7	32	2	21	1,738	30	162
Programmable Thermostat	MF	1			2.6			6			16
Programmable Thermostat	MF	2			1.8			1			2
Programmable Thermostat	MF	3									
Programmable Thermostat	MF	4									
Programmable Thermostat	MF	5									
Programmable Thermostat	MF	11									
Programmable Thermostat	MF	12	1.0		1.4	1		5	1		7
Programmable Thermostat	MF	13		9.8	1.5		1	8		10	12
Programmable Thermostat	MF	16									
Programmable Thermostat	MH	1			3.9			18			70
Programmable Thermostat	MH	2			1.7						
Programmable Thermostat	MH	3			1.3						
Programmable Thermostat	MH	4									
Programmable Thermostat	MH	5									
Programmable Thermostat	MH	11	18.5		1.4	2		20	37		28
Programmable Thermostat	MH	12			1.7			47			80
Programmable Thermostat	MH	13		9.8	1.5		3	6		29	9
Programmable Thermostat	MH	16			2.4			1			2
Programmable Thermostat	SF	1	28.8		3.2	1		8	29		26
Programmable Thermostat	SF	2									
Programmable Thermostat	SF	3		3.1	2.8		1	5		3	14
Programmable Thermostat	SF	4			2.5			2			5
Programmable Thermostat	SF	5									

Table B-1
PG&E Weather Sensitive Impact by Climate Zone

Measure	Dwel Type	Clim Zone	Unit Savings			Units Installed			Total kWh		Total Thm
			Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH
Programmable Thermostat	SF	11	21.2	6.2	2.9	2	2	6	42	12	17
Programmable Thermostat	SF	12	11.1	7.6	2.7	1	5	61	11	38	165
Programmable Thermostat	SF	13	15.3	11.8	2.4	1	4	20	15	47	48
Programmable Thermostat	SF	16									
Weatherstripping	MF	1	28.8		3.9	2		41	58		160
Weatherstripping	MF	2	20.9	0.6	2.7	185	40	315	3,867	24	851
Weatherstripping	MF	3	17.5	0.3	2.4	206	68	1,225	3,605	20	2,940
Weatherstripping	MF	4	16.2	0.6	2.1	100	28	761	1,620	17	1,598
Weatherstripping	MF	5	18.8			11			207		
Weatherstripping	MF	11	19.2	1.6	2.4	59	84	457	1,133	134	1,097
Weatherstripping	MF	12	20.2	1.4	2.3	346	252	2,524	6,989	353	5,805
Weatherstripping	MF	13	14.8	2.5	2.2	225	538	1,981	3,330	1,345	4,358
Weatherstripping	MF	16	21.8	1.0	2.4	86	1	10	1,875	1	24
Weatherstripping	MH	1	29.8	0.0	3.9	2	1	57	60	0	222
Weatherstripping	MH	2	22.4	0.8	2.9	35	10	216	784	8	626
Weatherstripping	MH	3	16.5	0.8	2.2	3	2	179	50	2	394
Weatherstripping	MH	4	16.3	0.5	2.1	2	3	137	33	2	288
Weatherstripping	MH	5			2.4			1			2
Weatherstripping	MH	11	18.5	1.8	2.4	63	120	555	1,166	216	1,332
Weatherstripping	MH	12	19.9	1.6	3.1	28	153	1,210	557	245	3,751
Weatherstripping	MH	13	15.1	2.5	3.0	8	104	326	121	260	978
Weatherstripping	MH	16	21.8	1.5	2.4	21	1	16	458	2	38
Weatherstripping	SF	1	28.8	0.0	4.7	15	2	47	432	0	221
Weatherstripping	SF	2	21.6	2.1	3.3	206	22	124	4,450	46	409
Weatherstripping	SF	3	17.8	1.2	3.5	30	13	1,606	534	16	5,621
Weatherstripping	SF	4	16.1	1.2	3.2	20	20	960	322	24	3,072
Weatherstripping	SF	5	17.7		3.7	4		1	71		4
Weatherstripping	SF	11	18.8	4.4	4.2	176	184	927	3,309	810	3,893
Weatherstripping	SF	12	17.9	3.8	4.4	107	347	2,999	1,915	1,319	13,196
Weatherstripping	SF	13	15.3	6.2	3.7	112	769	3,051	1,714	4,768	11,289
Weatherstripping	SF	16	25.5	5.2	2.9	44	1	27	1,122	5	78
Whole House Fan	MF	1									
Whole House Fan	MF	2									
Whole House Fan	MF	3									
Whole House Fan	MF	4									
Whole House Fan	MF	5									
Whole House Fan	MF	11									
Whole House Fan	MF	12		59.1			2			118	
Whole House Fan	MF	13		98.4			8			787	
Whole House Fan	MH	1									
Whole House Fan	MH	2									
Whole House Fan	MH	3									
Whole House Fan	MH	4									
Whole House Fan	MH	5									
Whole House Fan	MH	11									
Whole House Fan	MH	12									
Whole House Fan	MH	13									
Whole House Fan	SF	1									
Whole House Fan	SF	2									
Whole House Fan	SF	3									
Whole House Fan	SF	4									
Whole House Fan	SF	5									
Whole House Fan	SF	11									
Whole House Fan	SF	12		77.4			26			2,012	
Whole House Fan	SF	13		119.3			61			7,277	

Table B-2
SCE Weather Sensitive Impacts by Climate Zone

Measure	Dwel Type	Clim Zone	Unit Savings			Units Installed			Total kWh		Total Thm
			Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH
Attic Insulation	MF	6									
Attic Insulation	MF	8									
Attic Insulation	MF	9	162.5			1			163		
Attic Insulation	MF	10									
Attic Insulation	MF	13									
Attic Insulation	MF	14									
Attic Insulation	MF	15									
Caulking	MF	6	7.1	0.7		45	3		320	2	
Caulking	MF	8	7.1	0.7		79	25		561	18	
Caulking	MF	9	8.4	1.1		258	24		2,167	26	
Caulking	MF	10	8.6	1.6		347	152		2,984	243	
Caulking	MF	13	9.4	1.8		1	1		9	2	
Caulking	MF	14									
Caulking	MF	15	5.1	4.1		182	48		928	197	
Caulking	SF	6									
Caulking	SF	8									
Caulking	SF	9									
Caulking	SF	10	10.7			1			11		
Caulking	SF	13									
Caulking	SF	14	15.8			1			16		
Caulking	SF	15									
Central AC	MF	6									
Central AC	MF	8									
Central AC	MF	9		47.1			1			47	
Central AC	MF	10		216.3			1			216	
Central AC	MF	13									
Central AC	MF	14									
Central AC	MF	15		572.9			502			287,596	
Central AC	MH	6		95.5			1			96	
Central AC	MH	8		152.3			2			305	
Central AC	MH	9		205.0			2			410	
Central AC	MH	10		253.0			5			1,265	
Central AC	MH	13									
Central AC	MH	14		268.8			1			269	
Central AC	MH	15									
Central AC	SF	6									
Central AC	SF	8		95.5			1			96	
Central AC	SF	9		152.3			6			914	
Central AC	SF	10		205.0			10			2,050	
Central AC	SF	13		253.0			1			253	
Central AC	SF	14		268.6			3			806	
Central AC	SF	15		573.0			1			573	
Duct Sealing	MF	6									
Duct Sealing	MF	8		14.7			1			15	
Duct Sealing	MF	9		16.7			4			67	
Duct Sealing	MF	10		17.5			44			770	
Duct Sealing	MF	13									
Duct Sealing	MF	14									
Duct Sealing	MF	15		10.3			1			10	
Evaporative Cooler Cover	MF	6	4.7			1			5		
Evaporative Cooler Cover	MF	8									
Evaporative Cooler Cover	MF	9									
Evaporative Cooler Cover	MF	10									
Evaporative Cooler Cover	MF	13									
Evaporative Cooler Cover	MF	14									
Evaporative Cooler Cover	MF	15									
Evaporative Cooler Cover	SF	6									
Evaporative Cooler Cover	SF	8									

Table B-2
SCE Weather Sensitive Impacts by Climate Zone

Measure	Dwel Type	Clim Zone	Unit Savings			Units Installed			Total kWh		Total Thm
			Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH
Evaporative Cooler Cover	SF	9									
Evaporative Cooler Cover	SF	10									
Evaporative Cooler Cover	SF	13									
Evaporative Cooler Cover	SF	14	11.2			1			11		
Evaporative Cooler Cover	SF	15									
Evaporative Cooler Installation	MF	6									
Evaporative Cooler Installation	MF	8									
Evaporative Cooler Installation	MF	9		56.2			117			6,575	
Evaporative Cooler Installation	MF	10		70.7			59			4,171	
Evaporative Cooler Installation	MF	13		90.4			10			904	
Evaporative Cooler Installation	MF	14		114.2			133			15,189	
Evaporative Cooler Installation	MF	15		204.8			193			39,526	
Evaporative Cooler Installation	MH	6									
Evaporative Cooler Installation	MH	8									
Evaporative Cooler Installation	MH	9		57.3			14			802	
Evaporative Cooler Installation	MH	10		232.1			355			82,396	
Evaporative Cooler Installation	MH	13		307.3			26			7,990	
Evaporative Cooler Installation	MH	14		314.9			73			22,988	
Evaporative Cooler Installation	MH	15		696.0			260			180,960	
Evaporative Cooler Installation	SF	6									
Evaporative Cooler Installation	SF	8									
Evaporative Cooler Installation	SF	9		182.3			131			23,881	
Evaporative Cooler Installation	SF	10		241.5			1,126			271,929	
Evaporative Cooler Installation	SF	13		307.6			545			167,642	
Evaporative Cooler Installation	SF	14		308.9			670			206,963	
Evaporative Cooler Installation	SF	15		694.3			237			164,549	
Evaporative Cooler Maintenance	MF	6									
Evaporative Cooler Maintenance	MF	8									
Evaporative Cooler Maintenance	MF	9		29.1			15			437	
Evaporative Cooler Maintenance	MF	10		38.1			942			35,890	
Evaporative Cooler Maintenance	MF	13		48.2			900			43,380	
Evaporative Cooler Maintenance	MF	14		51.9			217			11,262	
Evaporative Cooler Maintenance	MF	15		109.2			399			43,571	
Evaporative Cooler Maintenance	MH	6									
Evaporative Cooler Maintenance	MH	8		17.5			1			18	
Evaporative Cooler Maintenance	MH	9		28.7			10			287	
Evaporative Cooler Maintenance	MH	10		35.6			99			3,524	
Evaporative Cooler Maintenance	MH	13									
Evaporative Cooler Maintenance	MH	14		49.7			28			1,392	
Evaporative Cooler Maintenance	MH	15		109.1			551			60,114	
Evaporative Cooler Maintenance	SF	6									
Evaporative Cooler Maintenance	SF	8		18.2			2			36	
Evaporative Cooler Maintenance	SF	9		29.8			130			3,874	
Evaporative Cooler Maintenance	SF	10		37.9			228			8,641	
Evaporative Cooler Maintenance	SF	13		48.2			195			9,399	
Evaporative Cooler Maintenance	SF	14		50.4			219			11,038	
Evaporative Cooler Maintenance	SF	15		109.1			613			66,878	
Minor Home Repair	MF	6	19.0	3.7		164	5		3,116	19	
Minor Home Repair	MF	8	18.2	4.1		331	42		6,024	172	
Minor Home Repair	MF	9	20.2	6.5		399	41		8,060	267	
Minor Home Repair	MF	10	24.3	9.3		385	1		9,364	9	
Minor Home Repair	MF	13	26.9	11.0		1	1		27	11	
Minor Home Repair	MF	14									
Minor Home Repair	MF	15	12.8	24.8		178	47		2,278	1,166	
Minor Home Repair	SF	6									
Minor Home Repair	SF	8	28.5			7			200		
Minor Home Repair	SF	9	27.3			1			27		
Minor Home Repair	SF	10	30.3			3			91		
Minor Home Repair	SF	13		11.3			1			11	
Minor Home Repair	SF	14	45.5			4			182		

Table B-2
SCE Weather Sensitive Impacts by Climate Zone

Measure	Dwel Type	Clim Zone	Unit Savings			Units Installed			Total kWh		Total Thm
			Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH
Minor Home Repair	SF	15									
Programmable Thermostat	MF	6									
Programmable Thermostat	MF	8									
Programmable Thermostat	MF	9									
Programmable Thermostat	MF	10									
Programmable Thermostat	MF	13									
Programmable Thermostat	MF	14									
Programmable Thermostat	MF	15		16.6			40			664	
Room AC	MF	6									
Room AC	MF	8									
Room AC	MF	9									
Room AC	MF	10									
Room AC	MF	13		196.9			45			8,861	
Room AC	MF	14		281.9			45			12,686	
Room AC	MF	15		445.8			164			73,111	
Weatherstripping	MF	6	11.5	0.6		161	4		1,852	2	
Weatherstripping	MF	8	11.0	0.7		336	44		3,696	31	
Weatherstripping	MF	9	12.3	1.1		428	48		5,264	53	
Weatherstripping	MF	10	13.1	1.6		437	162		5,725	259	
Weatherstripping	MF	13	14.4	1.8		1	1		14	2	
Weatherstripping	MF	14									
Weatherstripping	MF	15	7.7	4.1		182	48		1,401	197	
Weatherstripping	SF	6									
Weatherstripping	SF	8	16.5			7			116		
Weatherstripping	SF	9	18.5			1			18		
Weatherstripping	SF	10	19.7	3.9		3	1		59	4	
Weatherstripping	SF	13									
Weatherstripping	SF	14	29.5			4			118		
Weatherstripping	SF	15									

Table B-3
SoCalGas Weather Sensitive Impact by Climate Zone

Measure	Dwel Type	Clim Zone	Unit Savings			Units Installed			Total kWh		Total Thm
			Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH
Attic Insulation	MF	4									
Attic Insulation	MF	5									
Attic Insulation	MF	6			23.2			11			255
Attic Insulation	MF	8			14.3			275			3,933
Attic Insulation	MF	9			17.7			143			2,531
Attic Insulation	MF	10			19.9			27			537
Attic Insulation	MF	13									
Attic Insulation	MF	14									
Attic Insulation	MF	15									
Attic Insulation	MF	16			19.9			10			199
Attic Insulation	SF	4									
Attic Insulation	SF	5			28.2			2			56
Attic Insulation	SF	6			26.5			25			663
Attic Insulation	SF	8			18.1			562			10,172
Attic Insulation	SF	9			22.7			334			7,582
Attic Insulation	SF	10			24.3			247			6,002
Attic Insulation	SF	13			44.4			51			2,264
Attic Insulation	SF	14			47.6			23			1,095
Attic Insulation	SF	15			20.0			13			260
Attic Insulation	SF	16			30.1			79			2,378
Caulking	MF	4			0.9			2			2
Caulking	MF	5			0.9			8			7
Caulking	MF	6			0.9			4			4
Caulking	MF	8			0.5			232			116
Caulking	MF	9			0.6			490			294
Caulking	MF	10			0.6			59			35
Caulking	MF	13			1.4			18			25
Caulking	MF	14									
Caulking	MF	15			0.7			57			40
Caulking	MF	16			2.7			8			22
Caulking	MH	4			1.4			2			3
Caulking	MH	5			0.9			7			6
Caulking	MH	6			0.9			39			35
Caulking	MH	8			0.5			97			49
Caulking	MH	9			0.5			106			53
Caulking	MH	10			0.8			289			231
Caulking	MH	13			1.4			34			48
Caulking	MH	14			1.4			5			7
Caulking	MH	15			0.5			96			48
Caulking	MH	16			0.8						
Caulking	SF	4			2.4			14			34
Caulking	SF	5			1.8			56			101
Caulking	SF	6			4.5			30			135
Caulking	SF	8			1.9			457			868
Caulking	SF	9			2.3			287			660
Caulking	SF	10			2.1			369			775
Caulking	SF	13			2.8			162			454
Caulking	SF	14			2.8			22			62
Caulking	SF	15			1.1			62			68
Caulking	SF	16			3.2			25			80
Evaporative Cooler Cover	MF	4									
Evaporative Cooler Cover	MF	5									
Evaporative Cooler Cover	MF	6									
Evaporative Cooler Cover	MF	8									
Evaporative Cooler Cover	MF	9			0.4			18			7
Evaporative Cooler Cover	MF	10			0.5			57			29
Evaporative Cooler Cover	MF	13			0.9			22			20
Evaporative Cooler Cover	MF	14			0.9			1			1

Table B-3
SoCalGas Weather Sensitive Impact by Climate Zone

Measure	Dwel Type	Clim Zone	Unit Savings			Units Installed			Total kWh		Total Thm
			Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH
Evaporative Cooler Cover	MF	15			0.3			7			2
Evaporative Cooler Cover	MF	16			0.5			16			8
Evaporative Cooler Cover	MH	4									
Evaporative Cooler Cover	MH	5									
Evaporative Cooler Cover	MH	6			0.6			17			10
Evaporative Cooler Cover	MH	8									
Evaporative Cooler Cover	MH	9			0.4			72			29
Evaporative Cooler Cover	MH	10			0.5			166			83
Evaporative Cooler Cover	MH	13			0.9			18			16
Evaporative Cooler Cover	MH	14			0.9			7			6
Evaporative Cooler Cover	MH	15			4.1			61			250
Evaporative Cooler Cover	MH	16									
Evaporative Cooler Cover	SF	4									
Evaporative Cooler Cover	SF	5									
Evaporative Cooler Cover	SF	6									
Evaporative Cooler Cover	SF	8			0.5			7			4
Evaporative Cooler Cover	SF	9			0.8			7			6
Evaporative Cooler Cover	SF	10			1.0			220			220
Evaporative Cooler Cover	SF	13			2.8			311			871
Evaporative Cooler Cover	SF	14			3.2			38			122
Evaporative Cooler Cover	SF	15			0.5			26			13
Evaporative Cooler Cover	SF	16			0.9			70			63
Furnace Repair	MF	4									
Furnace Repair	MF	5									
Furnace Repair	MF	6									
Furnace Repair	MF	8									
Furnace Repair	MF	9									
Furnace Repair	MF	10									
Furnace Repair	MF	13									
Furnace Repair	MF	14									
Furnace Repair	MF	15									
Furnace Repair	MF	16									
Furnace Repair	MH	4									
Furnace Repair	MH	5			27.0			3			81
Furnace Repair	MH	6			23.7			3			71
Furnace Repair	MH	8			16.2			18			292
Furnace Repair	MH	9			20.0			23			460
Furnace Repair	MH	10			23.2			11			255
Furnace Repair	MH	13			42.5			3			128
Furnace Repair	MH	14			42.5			3			128
Furnace Repair	MH	15			15.2			4			61
Furnace Repair	MH	16									
Furnace Repair	SF	4									
Furnace Repair	SF	5			27.0			7			189
Furnace Repair	SF	6			23.7			24			569
Furnace Repair	SF	8			16.2			120			1,944
Furnace Repair	SF	9			20.0			114			2,280
Furnace Repair	SF	10			23.0			59			1,357
Furnace Repair	SF	13			42.5			29			1,233
Furnace Repair	SF	14			42.5			11			468
Furnace Repair	SF	15			15.2			1			15
Furnace Repair	SF	16			23.2			5			116
Furnace Replacement	MF	4									
Furnace Replacement	MF	5									
Furnace Replacement	MF	6									
Furnace Replacement	MF	8									
Furnace Replacement	MF	9									
Furnace Replacement	MF	10									
Furnace Replacement	MF	13									
Furnace Replacement	MF	14									

Table B-3
SoCalGas Weather Sensitive Impact by Climate Zone

Measure	Dwel Type	Clim Zone	Unit Savings			Units Installed			Total kWh		Total Thm
			Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH
Furnace Replacement	MF	15									
Furnace Replacement	MF	16									
Furnace Replacement	MH	4									
Furnace Replacement	MH	5			32.4			4			130
Furnace Replacement	MH	6			29.6			42			1,243
Furnace Replacement	MH	8			23.6			155			3,658
Furnace Replacement	MH	9			23.6			128			3,021
Furnace Replacement	MH	10			34.8			74			2,575
Furnace Replacement	MH	13									
Furnace Replacement	MH	14			51.0			12			612
Furnace Replacement	MH	15			22.8			20			456
Furnace Replacement	MH	16									
Furnace Replacement	SF	4			52.1			5			261
Furnace Replacement	SF	5			40.5			27			1,094
Furnace Replacement	SF	6			37.0			82			3,034
Furnace Replacement	SF	8			26.6			919			24,445
Furnace Replacement	SF	9			30.8			707			21,776
Furnace Replacement	SF	10			34.2			314			10,739
Furnace Replacement	SF	13			63.8			119			7,592
Furnace Replacement	SF	14			63.8			62			3,956
Furnace Replacement	SF	15			25.3			45			1,139
Furnace Replacement	SF	16			59.9			66			3,953
Minor Home Repair	MF	4			3.6			11			40
Minor Home Repair	MF	5			2.3			10			23
Minor Home Repair	MF	6			2.3			371			853
Minor Home Repair	MF	8			1.6			7,564			12,102
Minor Home Repair	MF	9			1.7			6,500			11,050
Minor Home Repair	MF	10			2.0			467			934
Minor Home Repair	MF	13			3.7			63			233
Minor Home Repair	MF	14			3.7			3			11
Minor Home Repair	MF	15			1.5			222			333
Minor Home Repair	MF	16			2.2			106			233
Minor Home Repair	MH	4			3.6			1			4
Minor Home Repair	MH	5			2.3			23			53
Minor Home Repair	MH	6			1.6			89			142
Minor Home Repair	MH	8			1.5			74			111
Minor Home Repair	MH	9			1.9			194			369
Minor Home Repair	MH	10			2.0			361			722
Minor Home Repair	MH	13			3.7			33			122
Minor Home Repair	MH	14			3.7			9			33
Minor Home Repair	MH	15			2.1			150			315
Minor Home Repair	MH	16			9.6						
Minor Home Repair	SF	4			7.2			26			187
Minor Home Repair	SF	5			4.7			105			494
Minor Home Repair	SF	6			6.7			211			1,414
Minor Home Repair	SF	8			4.3			4,711			20,257
Minor Home Repair	SF	9			4.5			4,050			18,225
Minor Home Repair	SF	10			4.6			1,821			8,377
Minor Home Repair	SF	13			8.2			890			7,298
Minor Home Repair	SF	14			9.5			173			1,644
Minor Home Repair	SF	15			3.1			587			1,820
Minor Home Repair	SF	16			7.2			422			3,038
Weatherstripping	MF	4			2.2			65			143
Weatherstripping	MF	5			1.5			35			53
Weatherstripping	MF	6			1.4			388			543
Weatherstripping	MF	8			1.0			8,133			8,133
Weatherstripping	MF	9			1.0			6,754			6,754
Weatherstripping	MF	10			1.2			729			875
Weatherstripping	MF	13			2.3			84			193
Weatherstripping	MF	14			2.3			7			16

Table B-3
SoCalGas Weather Sensitive Impact by Climate Zone

Measure	Dwel Type	Clim Zone	Unit Savings			Units Installed			Total kWh		Total Thm
			Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH
Weatherstripping	MF	15			0.9			382			344
Weatherstripping	MF	16			1.4			143			200
Weatherstripping	MH	4			2.3			3			7
Weatherstripping	MH	5			1.5			128			192
Weatherstripping	MH	6			1.0			166			166
Weatherstripping	MH	8			0.9			229			206
Weatherstripping	MH	9			1.2			474			569
Weatherstripping	MH	10			1.3			874			1,136
Weatherstripping	MH	13			2.3			51			117
Weatherstripping	MH	14			2.3			25			58
Weatherstripping	MH	15			1.2			255			306
Weatherstripping	MH	16									
Weatherstripping	SF	4			2.6			53			138
Weatherstripping	SF	5			2.1			234			491
Weatherstripping	SF	6			4.2			249			1,046
Weatherstripping	SF	8			2.6			4,815			12,519
Weatherstripping	SF	9			2.4			4,212			10,109
Weatherstripping	SF	10			2.1			2,084			4,376
Weatherstripping	SF	13			3.6			940			3,384
Weatherstripping	SF	14			4.6			229			1,053
Weatherstripping	SF	15			1.3			655			852
Weatherstripping	SF	16			3.6			475			1,710

Table B-4
SDG&E Weather Sensitive Impacts by Climate Zone

	Dwel	Clim	Unit Savings			Units Installed			Total kWh		Total Thm
Measure	Type	Zone	Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH
Attic Insulation	MF	7									
Attic Insulation	MF	10									
Attic Insulation	MF	14									
Attic Insulation	SF	7	146.9	49.7	25.8	2	4	244	294	199	6,295
Attic Insulation	SF	10	162.5		27.9	4		24	650		670
Attic Insulation	SF	14									
Caulking	MF	7	6.7	0.9	2.2	258	65	2,331	1,729	59	5,128
Caulking	MF	10	8.0	1.2	1.5	224	125	602	1,792	150	903
Caulking	MF	14	8.2	1.2	1.6	1	6	52	8	7	83
Caulking	MH	7	6.7	0.7	5.2	48	8	2,119	322	6	11,019
Caulking	MH	10	8.0	1.2	3.7	9	89	2,312	72	107	8,554
Caulking	MH	14			3.9			61			241
Caulking	SF	7	9.9	2.3	4.5	69	19	1,394	683	44	6,273
Caulking	SF	10	11.9	2.9	5.3	45	14	218	536	41	1,155
Caulking	SF	14									
Central AC	MF	7									
Central AC	MF	10									
Central AC	MF	14									
Central AC	MH	7									
Central AC	MH	10		164.3			194			31,874	
Central AC	MH	14		195.0							
Central AC	SF	7									
Central AC	SF	10									
Central AC	SF	14									
Duct Sealing	MF	7			1.1			8			9
Duct Sealing	MF	10			0.8			2			2
Duct Sealing	MF	14									
Duct Sealing	MH	7		2.8	9.8		4	994		11	9,692
Duct Sealing	MH	10		4.8	6.9		54	1,411		259	9,789
Duct Sealing	MH	14			7.4			60			444
Duct Sealing	SF	7		9.2	8.4		9	671		83	5,662
Duct Sealing	SF	10		11.6	9.9		9	160		104	1,590
Duct Sealing	SF	14									
Evaporative Cooler Cover	MF	7									
Evaporative Cooler Cover	MF	10									
Evaporative Cooler Cover	MF	14									
Evaporative Cooler Cover	MH	7	3.5		8.6	8		115	28		989
Evaporative Cooler Cover	MH	10	4.3		5.4	1		297	4		1,604
Evaporative Cooler Cover	MH	14			5.8			16			92
Evaporative Cooler Cover	SF	7									
Evaporative Cooler Cover	SF	10									
Evaporative Cooler Cover	SF	14									
Evaporative Cooler Installation	MF	7									
Evaporative Cooler Installation	MF	10									
Evaporative Cooler Installation	MF	14									
Evaporative Cooler Installation	SF	7		92.7			1			93	
Evaporative Cooler Installation	SF	10		221.4			1			221	
Evaporative Cooler Installation	SF	14									
Furnace Repair	MF	7			24.7			36			889
Furnace Repair	MF	10			30.1			13			391
Furnace Repair	MF	14			30.1			1			30
Furnace Repair	MH	7			24.8			257			6,374
Furnace Repair	MH	10			29.1			202			5,878
Furnace Repair	MH	14			29.1			3			87
Furnace Repair	SF	7			24.7			141			3,483
Furnace Repair	SF	10			27.6			18			497
Furnace Repair	SF	14									
Furnace Replacement	MF	7									
Furnace Replacement	MF	10									

Table B-4
SDG&E Weather Sensitive Impacts by Climate Zone

	Dwel	Clim	Unit Savings			Units Installed			Total kWh		Total Thm
Measure	Type	Zone	Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH	Elec SH	Elec AC	Gas SH
Furnace Replacement	MF	14									
Furnace Replacement	MH	7			37.2			186			6,919
Furnace Replacement	MH	10			44.7			149			6,660
Furnace Replacement	MH	14			44.7			5			224
Furnace Replacement	SF	7			37.0			44			1,628
Furnace Replacement	SF	10			45.1			12			541
Furnace Replacement	SF	14									
Minor Home Repair	MF	7	17.0	5.1	3.2	277	68	2,683	4,709	347	8,586
Minor Home Repair	MF	10	20.4	7.1	4.7	185	116	717	3,774	824	3,370
Minor Home Repair	MF	14	20.6	7.2	3.8	2	6	51	41	43	194
Minor Home Repair	MH	7	17.0	4.4	3.9	87	10	1,763	1,479	44	6,876
Minor Home Repair	MH	10	20.6	7.1	6.1	3	69	2,229	62	490	13,597
Minor Home Repair	MH	14			4.9			53			261
Minor Home Repair	SF	7	24.6	7.0	6.8	89	24	1,864	2,189	168	12,675
Minor Home Repair	SF	10	29.7	8.5	8.0	95	29	343	2,822	247	2,744
Minor Home Repair	SF	14	30.1			9			271		
Programmable Thermostat	MF	7									
Programmable Thermostat	MF	10									
Programmable Thermostat	MF	14									
Programmable Thermostat	MH	7			1.1			71			78
Programmable Thermostat	MH	10			1.0			263			263
Programmable Thermostat	MH	14									
Programmable Thermostat	SF	7									
Programmable Thermostat	SF	10									
Programmable Thermostat	SF	14									
Room AC	MF	7									
Room AC	MF	10		128.7			184			23,681	
Room AC	MF	14		183.0							
Room AC	SF	7									
Room AC	SF	10									
Room AC	SF	14									
Weatherstripping	MF	7	10.2	0.9	2.8	299	70	2,631	3,050	63	7,367
Weatherstripping	MF	10	12.3	1.2	2.5	224	123	618	2,755	148	1,545
Weatherstripping	MF	14	12.4	1.2	2.3	1	6	52	12	7	120
Weatherstripping	MH	7	10.3	0.7	5.4	17	6	1,281	175	4	6,917
Weatherstripping	MH	10	12.4	1.2	4.9	7	51	1,520	87	61	7,448
Weatherstripping	MH	14			4.5			46			207
Weatherstripping	SF	7	9.9	2.3	4.6	76	19	1,444	752	44	6,642
Weatherstripping	SF	10	11.9	2.9	5.3	46	16	226	547	46	1,198
Weatherstripping	SF	14	12.0			1			12		
Whole House Fan	MF	7									
Whole House Fan	MF	10									
Whole House Fan	MF	14									
Whole House Fan	SF	7									
Whole House Fan	SF	10		259.2			1			259	
Whole House Fan	SF	14									

C

WEATHER STATION DATA

This appendix presents normal heating degree day (HDD) and cooling degree (CDD) information by utility, CEC climate zone, and weather station. Degree days are long term annual averages, expressed on a per-day basis.

Table C-1
Weather Station Data

Utility	CEC CZ	Weather Station	HDD	CDD	Percent of Total Climate Zone Customers in Given Weather Station								
					SF Gas Ht	MF Gas Ht	MH Gas Ht	SF Elec Ht	MF Elec Ht	MH Elec Ht	SF AC	MF AC	MH AC
PG&E	1	Eureka	11.0363	0.0236	100%	100%	100%	100%	100%	80%	100%	100%	100%
PG&E	1	Ukiah	8.3093	2.3777						20%			
PG&E	2	Eureka	11.0363	0.0236				1%					
PG&E	2	San Rafael	7.7731	1.0873	10%	22%	14%	1%	37%		4%	29%	
PG&E	2	Santa Rosa	7.538	1.2306	61%	49%	22%	7%	48%		10%	33%	9%
PG&E	2	Ukiah	8.3093	2.3777	29%	29%	65%	92%	15%	100%	86%	38%	91%
PG&E	3	Belmont	6.0207	1.1942	12%	3%		14%	3%		11%	2%	
PG&E	3	Colma	8.9852	0.1252	9%	3%		8%	3%		3%	2%	
PG&E	3	Concord	6.2965	2.705	1%	1%	4%	8%	4%	17%	9%	5%	50%
PG&E	3	Milpitas	5.9381	1.4043	23%	13%	77%	10%	13%	33%	29%	13%	33%
PG&E	3	Oakland	6.2891	0.8947	31%	24%	3%	25%	14%	17%	23%	14%	
PG&E	3	Potrero	6.4333	0.583	12%	22%	2%	6%	57%	33%	9%	49%	
PG&E	3	Salinas	7.2964	0.2837	5%	19%	4%	6%	1%		6%	3%	17%
PG&E	3	San Rafael	7.7731	1.0873	1%	1%			0%		11%		
PG&E	3	Santa Cruz	7.6173	0.3299	7%	13%	10%	22%	4%			13%	
PG&E	4	Bakersfield	5.4552	6.549									
PG&E	4	Belmont	6.0207	1.1942	0%	0%							
PG&E	4	Cupertino	5.8418	1.7991	12%	50%	20%	8%	12%		10%	24%	
PG&E	4	Milpitas	5.9381	1.4043	81%	49%	67%	54%	84%	100%	89%	66%	100%
PG&E	4	Paso Robles	7.8285	2.292	0%			21%	3%		2%	9%	
PG&E	4	Salinas	7.2964	0.2837	6%	2%	13%	13%	1%			2%	
PG&E	4	Santa Cruz	7.6173	0.3299				4%					
PG&E	5	Bakersfield	5.4552	6.549									
PG&E	5	Paso Robles	7.8285	2.292				25%	10%		60%	88%	
PG&E	5	Santa Maria	6.7973	0.3081				75%	90%		40%	13%	
PG&E	11	Auburn	9.4365	2.6929	4%	3%		15%	13%	3%	7%	4%	2%
PG&E	11	Chico	6.7894	4.5884	43%	52%	41%	44%	35%	61%	42%	58%	41%
PG&E	11	Concord	6.2965	2.705	1%								
PG&E	11	Marysville	6.8782	4.1321	32%	22%	27%	11%	43%	6%	31%	29%	26%
PG&E	11	Red Bluff	6.637	5.3687	18%	5%	32%	30%	7%	30%	19%	6%	31%
PG&E	11	Sacramento	6.3348	3.9791	2%	18%	1%		2%		2%	3%	
PG&E	12	Angels Camp	8.017	4.0098	0%	0%	1%	19%	2%	8%	2%	1%	2%
PG&E	12	Auburn	9.4365	2.6929				40%	10%	16%	2%	7%	1%
PG&E	12	Concord	6.2965	2.705	6%	18%	1%	5%	25%	16%	4%	12%	1%
PG&E	12	Fresno	5.6814	6.4105	2%	0%		1%		4%	3%	0%	2%

Table C-1
Weather Station Data

Utility	CEC CZ	Weather Station	HDD	CDD	Percent of Total Climate Zone Customers in Given Weather Station								
					SF Gas Ht	MF Gas Ht	MH Gas Ht	SF Elec Ht	MF Elec Ht	MH Elec Ht	SF AC	MF AC	MH AC
PG&E	12	Oakland	6.2891	0.8947									
PG&E	12	Sacramento	6.3348	3.9791	26%	41%	14%	5%	26%	12%	18%	20%	15%
PG&E	12	San Rafael	7.7731	1.0873	0%	0%						0%	
PG&E	12	San Ramon	7.315	1.7782	1%	2%			2%		0%	1%	
PG&E	12	Stockton	6.2005	4.1595	64%	39%	85%	30%	36%	44%	71%	59%	79%
PG&E	13	Bakersfield	5.4552	6.549	28%	19%	40%	14%	15%	33%	28%	22%	49%
PG&E	13	Fresno	5.6814	6.4105	72%	81%	57%	86%	85%	67%	71%	78%	48%
PG&E	13	Stockton	6.2005	4.1595	1%	0%	2%	1%			1%	0%	3%
PG&E	16	Angels Camp	8.017	4.0098						20%			75%
PG&E	16	Auburn	9.4365	2.6929				52%	100%	30%	22%	100%	
PG&E	16	Chico	6.7894	4.5884				5%					
PG&E	16	Eureka	11.0363	0.0236									
PG&E	16	Red Bluff	6.637	5.3687	89%	100%	100%	24%		30%	67%		25%
PG&E	16	Salinas	7.2964	0.2837	11%								
PG&E	16	Ukiah	8.3093	2.3777				19%		20%	11%		
SCE	6	El Segundo	4.579	0.6262				2%	5%			4%	
SCE	6	Goleta	5.8874	0.4658					0%			0%	
SCE	6	Long Beach	3.9524	1.7334				78%	46%	20%	77%	64%	25%
SCE	6	Moorpark	6.4127	0.8858					0%			0%	
SCE	6	Rialto	4.8303	4.0712					0%				
SCE	6	Santa Ana	4.1743	1.7977									
SCE	6	Ventura	5.8138	0.6036				10%	8%	40%	14%	10%	13%
SCE	6	Victorville	8.3497	4.4217								0%	
SCE	6	Westminister	4.2413	1.411				11%	40%	40%	9%	21%	63%
SCE	8	Cathedral City	2.8532	10.7847							1%		
SCE	8	El Segundo	4.579	0.6262									
SCE	8	Long Beach	3.9524	1.7334				9%	9%	100%	4%	5%	38%
SCE	8	Rosemead	4.5096	2.7107				2%	2%		3%	2%	
SCE	8	Santa Ana	4.1743	1.7977				89%	89%		92%	93%	63%
SCE	8	Westminister	4.2413	1.411					1%			1%	
SCE	9	Cathedral City	2.8532	10.7847					0%			0%	
SCE	9	El Segundo	4.579	0.6262					0%			0%	
SCE	9	Moorpark	6.4127	0.8858				4%	1%		4%	3%	44%
SCE	9	Rosemead	4.5096	2.7107				40%	61%	100%	36%	51%	32%
SCE	9	San Dimas	4.7336	2.9707				20%	14%		55%	29%	24%
SCE	9	Santa Ana	4.1743	1.7977				36%	23%		5%	17%	
SCE	9	Valencia	6.0952	3.0236					1%		1%	0%	

Table C-1
Weather Station Data

Utility	CEC CZ	Weather Station	HDD	CDD	Percent of Total Climate Zone Customers in Given Weather Station								
					SF Gas Ht	MF Gas Ht	MH Gas Ht	SF Elec Ht	MF Elec Ht	MH Elec Ht	SF AC	MF AC	MH AC
SCE	10	Barstow	6.5824	6.8193									
SCE	10	Rialto	4.8303	4.0712				62%	65%	21%	55%	50%	39%
SCE	10	Romoland	6.3867	3.4349				38%	35%	79%	46%	50%	61%
SCE	10	Rosemead	4.5096	2.7107									
SCE	10	Santa Ana	4.1743	1.7977									
SCE	10	Westminister	4.2413	1.411									
SCE	13	Cathedral City	2.8532	10.7847							0%		
SCE	13	Tulare	7.1739	4.7625				100%	100%	100%	100%	100%	100%
SCE	13	Victorville	8.3497	4.4217							0%		
SCE	13	Westminister	4.2413	1.411							0%		
SCE	14	Barstow	6.5824	6.8193				10%	12%	27%	4%	15%	19%
SCE	14	Lancaster	7.8644	5.0592				30%	42%		44%	36%	36%
SCE	14	Ridgecrest	6.777	7.496				4%			2%	0%	
SCE	14	Tulare	7.1739	4.7625							0%		
SCE	14	Valencia	6.0952	3.0236					1%			0%	
SCE	14	Victorville	8.3497	4.4217				48%	19%	46%	46%	23%	32%
SCE	14	Yucca Valley	7.7991	5.1316				8%	27%	27%	4%	26%	14%
SCE	15	Blythe	3.3502	10.8128				29%	2%	11%	10%	4%	4%
SCE	15	Cathedral City	2.8532	10.7847				71%	98%	89%	90%	96%	96%
SCE	15	Tulare	7.1739	4.7625							0%		
SCE	16	Bishop	11.0948	3.5134				13%					17%
SCE	16	Rimforest	14.1364	1.0162				88%	100%	100%	100%	100%	83%
SCG	4	Lancaster/Fresno/Bakersfield	6.5134		80%	89%	100%						
SCG	4	LAX/NewportBch/Santa Barbara	4.133		20%	12%							
SCG	5	LAX/NewportBch/Santa Barbara	4.133		100%	100%	100%						
SCG	6	LA Civic Center/Santa Ana	2.4072		14%	3%	80%						
SCG	6	LAX/NewportBch/Santa Barbara	4.133		87%	97%	20%						
SCG	8	LA Civic Center/Santa Ana	2.4072		93%	89%	90%						
SCG	8	Lancaster/Fresno/Bakersfield	6.5134		4%	7%							
SCG	8	LAX/NewportBch/Santa Barbara	4.133		3%	4%	10%						
SCG	9	Burbank/Ontario/Riv/San Bern	3.5531		65%	46%	81%						
SCG	9	LA Civic Center/Santa Ana	2.4072		35%	54%	19%						
SCG	9	LAX/NewportBch/Santa Barbara	4.133										
SCG	10	Burbank/Ontario/Riv/San Bern	3.5531		99%	83%	100%						
SCG	10	El Centro/Palm Springs	2.3269		0%	16%							
SCG	10	LA Civic Center/Santa Ana	2.4072		1%	0%							
SCG	13	Lancaster/Fresno/Bakersfield	6.5134		100%	100%	100%						

Table C-1
Weather Station Data

Utility	CEC CZ	Weather Station	HDD	CDD	Percent of Total Climate Zone Customers in Given Weather Station								
					SF Gas Ht	MF Gas Ht	MH Gas Ht	SF Elec Ht	MF Elec Ht	MH Elec Ht	SF AC	MF AC	MH AC
SCG	14	Big Bear	16.9753		1%								
SCG	14	Lancaster/Fresno/Bakersfield	6.5134		99%	100%	100%						
SCG	15	Burbank/Ontario/Riv/San Bern	3.5531		12%	20%							
SCG	15	El Centro/Palm Springs	2.3269		89%	80%	100%						
SCG	16	Big Bear	16.9753		12%	3%	50%						
SCG	16	Burbank/Ontario/Riv/San Bern	3.5531		86%	97%	40%						
SCG	16	LA Civic Center/Santa Ana	2.4072		2%		10%						
SDG&E	6	Coastal	3.7569	2.6253					100%				
SDG&E	7	Coastal	3.7569	2.6253	41%	36%	15%	41%	39%		62%	57%	7%
SDG&E	7	Maritime	3.811	1.6533	59%	64%	85%	58%	61%	100%	38%	43%	93%
SDG&E	7	Transitional	4.6098	3.1143				1%	0%			1%	
SDG&E	10	Coastal	3.7569	2.6253	50%	24%	35%	12%	5%	11%	19%	2%	13%
SDG&E	10	Maritime	3.811	1.6533	0%		0%						
SDG&E	10	Transitional	4.6098	3.1143	49%	77%	65%	88%	95%	90%	81%	98%	87%
SDG&E	14	Transitional	4.6098	3.1143		100%		100%	100%	100%	100%	100%	100%

D

PUBLIC INPUT WORKSHOP REPORT

PY2001 LIEE Program Evaluation
Final Report Presentation
Public Input Workshop
Pacific Energy Center, San Francisco, CA
March 26, 2003

Attendees: The following utility staff, consultants, and guests were present for the workshop:

PG&E:	Mary O'Drain	415-973-2317	mjob@pge.com
ICA:	Bob Burt	916-444-2950	bob.burt@macnexus.org
SCE:	Jack Parkhill	626-302-8040	jack.parkhill@sce.com
XENERGY:	Fred Coito	510-891-0446	fcoito@kema-xenergy.com
XENERGY:	Tami Rasmussen	510-891-0446	trasmussen@ kema-xenergy.com
XENERGY:	Kathleen Gaffney	510-891-0446	kgaffney@ kema-xenergy.com
CPUC-ORA	Gilbert Escamilla	415-703-1862	gil@cpuc.ca.gov
CPUC-ED	Jeorge Tagnipes	415-703-2451	jst@cpuc.ca.gov

Call-Ins: The following utility staff called in to the meeting:

SCG:	Sharon Lee	213-244-3248	slee@semprautilities.com
SCE:	Angela Jones	626-302-8302	angela.jones@sce.com
SDG&E:	Kevin McKinley	858-654-1260	kmckinley@semprautilities.com
SDG&E:	Dave Rogers	858-636-5791	drogers@semprautilities.com

A Public Input Workshop was held on March 26, 2003 at the Pacific Energy Center in San Francisco. Eight persons were present for the workshop, and four persons participated by conference call. This Workshop Report summarizes the public input and discussion from that meeting.

The workshop was convened shortly after 10am. Kathleen Gaffney of KEMA-XENERGY introduced the evaluation final results workshop. Fred Coito of KEMA-XENERGY then presented the PY2001 LIEE Program Impacts (included as Attachment A). The floor was then opened for comments and questions. Several issues were raised and discussed. Subsequently, Tami Rasmussen of KEMA-XENERGY then presented PY2001 Process Evaluation findings (included as Attachment A). Several issues were raised and discussed. Presented below is a summary of the discussions that took place after each presentation, by topic. Additional comments were submitted following the workshop, and these written comments are included as an attachment to this report.

Final Results of the Impact Evaluation

1. Is there a "next step" for following up on recommendations? (Bob Burt)

There weren't any real impact recommendations from this impact evaluation. The design is set and determined by the utilities. The impact evaluation approach does a good job at looking at whole-house savings, however it is not the best approach for deriving measure-level results.

2. Note that the utilities are planning on studying the issue of how best to determine measure-level impacts. (Angela Jones)

3. In PY2002, SCE impacts are attributed mostly to installation of CFLs. Note that as they go to comprehensive treatment, savings will go down significantly. (Angela Jones)

4. An analysis of bill savings might be valuable, since that is what the program is designed to address. (Bob Burt)

5. The utilities perform a bill savings analysis, using the results from this impact evaluation as inputs. (Angela Jones)

Final Results of the Process Evaluation

1. These recommendations in effect are not expected to create immediate action. There is a follow-up step that will determine what the utilities do or are told to do. (Bob Burt)

2. Some things are within the utilities control to take action on or not. Others will need to be taken up by other parties, e.g., new measures, income documentation requirements, etc. (Mary O'Drain)

3. So the specific recommendations regarding income documentation will await a team recommendation followed by the CPUC decision. (Bob Burt)

4. The commission could decide to change something or direct the team to look at it again. (Mary O'Drain)

5. There could be commission action based on this? (Bob Burt)

Some recommendations have already been implemented or the utilities are working on them. The report executive summary and recommendation sections note where we were told something had changed or is currently being worked on. (KEMA-XENERGY).

6. For example, for PG&E changed its contractor payment process to "pay-as-you-go", which is an example of PG&E taking action without an order. There are

different types of recommendations – some can be acted on, some need further direction on, some could be ordered. (Mary O'Drain).

7. How was the sample developed for the participant survey? (Gilbert Escamilla)

It wasn't completely random. We over-sampled some measures to ensure adequate results for all measures. (KEMA-XENERGY)

The meeting was concluded at approximately 11:00am.

Attachments. Written comments submitted after the workshop are included as Attachment A. The PY2001 LIEE program evaluation final results workshop presentation is included as Attachment B.

Workshop Attachment A:
Written Comments Submitted after the Public Workshop

Comments by the
Insulation Contractors Association
on the
Process Evaluation of the 2001 Statewide Energy Efficiency (LIEE) Program

Robert E. Burt
4153 Northgate Blvd. # 6
Sacramento, CA 95834
Telephone: (916) 568-1826
e-mail: bburt@macnexus.org

Dated: March 31, 2003

Introduction

I It Is Important That Action Be Taken On This Report

II. "Insulation was found to be more effective than previously believed."

III. Other Issues

- A. Duct Installation Standards
- B. Income Documentation Retention Should be Reconsidered.
- C. Comprehensive Treatment in SCE Territory.
- D. Increased Coordination Between SCE and SCG.
- E. Improving Program Management.
- F. Implementation Improvements.
- G. Offering the Most Cost Effective Mix of Measures

1 INTRODUCTION

Comes now, the Insulation Contractors Association (ICA), to provide follow up comments on the subject Report. The ICA is a voluntary association of contractors who install insulation. Most of our members also have other interests. *Where we make recommendations for measure-related action, we believe those recommendations should be provided to the Utility Team for consideration as a part of the planning for the Year 2004 LIEE program.*

2 I IT IS IMPORTANT THAT ACTION BE TAKEN ON THIS REPORT

At the March 26 Workshop on the Report, it was made clear that the Report is not an action document. Any action which follows must be on the initiative of either the Commission or (where within

their powers) the Program managers. *We believe that it is important that action be taken on the Recommendations therein, which are generally thoughtful and serious.*

II. "Insulation was found to be more effective than previously believed."

The above is a reasonable paraphrase of a part of the verbal summary provided by the first KEMA consultant to speak at the Workshop. We found this comment nowhere in the published Report. We assume it is there by inference, if the insulation measure savings data are compared to those of previous years. However, we have no way to derive it, since each year's attic insulation installations consisted of a complex mixture of different amounts of insulation actually placed in each attic. As insulation contractors, we obviously believe that this finding is very important. *We recommend that the improved attic insulation findings be reviewed to consider whether attic insulation should be called for in Climate Zones where it is not now required.*

A. Duct Installation Standards (Report p 5-2). This issue was also raised by Winegar in the LIEE Cost Effectiveness Workshop. He pointed out that the going standard was tight enough so that really leaky ducts could not be brought up to it for any reasonable expenditure; suggested before and after tests to provide payment for improvement. In our Comments, *we suggested that before and after tests might so increase the overhead as to make the measure not cost effective and suggested simply reducing the standard.* We recommend that any study for changes in this measure interview Winegar and any other contractors who did significant duct testing, wither in the LIEE or in the related non-low income program.

B. Income Documentation Retention Should be Reconsidered. (Report, p 5-2) The fact that other Program Managers did not feel the need for this action for years is, to us, the best indication that it should be reconsidered. Keep in mind that all program dollars spent on customer qualification have zero energy efficiency benefit. *Reconsider the document retention aspect of customer qualification.*

C. Comprehensive Treatment in SCE Territory. (Report p 5-3) We obviously support comprehensive treatment. However, we are sensitive to SCE's comment that this will reduce the number of

customers who can be treated with the available funds. However, as the Report points out, in 1993 the Feds increased the required energy efficiency of refrigerators, so the existing stock which can provide significant energy improvement is obviously declining.

D. Increased Coordination Between SCE and SCG. (Report p 5-4) We agree with that increased coordination is desirable. But we also point out that the existing SCE-SCG agreement is the only part of the LIEE program that specifically excludes private contractors. *We recommend that any new SCE-SCG coordination agreement allow a private contractor to work in any area where he already has contracted work.*

E. Improving Program Management. (Report 5-4, et seq) We believe that the recommendations made here are within the powers of the existing Program Managers. *We also recommend that the Commission periodically privately interview contractors on these and related issues, to prevent similar problems in the future.* It must be recognized that contractors are greatly inhibited from filing complaints with the Commission, since many aspects of Contract Administration are solely judgmental and contractors fear retribution if a complaint, however justified, is made to the Commission.

F. Implementation Improvements. (Report p 5-6 et seq) The bulk of the Recommendations made here favorably respond to actual implementation actions in the PY 2001 program. *They should therefore be well within the scope of any order for the PY 2004 program.*

G. Offering the Most Cost Effective Mix of Measures (Report p 5-9 et seq) *We believe each of the measure suggestions found here deserve serious consideration.*

Respectfully submitted,

Robert E. Burt, Consultant

SCE Comments on the Draft Final Report
Process Evaluation of the 2001 Statewide Low-Income Energy Efficiency (LIEE) Program

SCE appreciates the opportunity to offer comments on the Draft Workshop Report (the "Report"). SCE appreciates the extent to which the recent changes to LIEE programs have added to the complexity of tasks involved in preparing the Report. Overall, the Report does an excellent job of reflecting SCE's 2001 administrative structure and processes and many of SCE's process revisions that have been made since that time. At the same time, however, the Report inadequately considers how differences in the SCE and SoCalGas programs affect the feasibility of some of the Report's broad recommendations for coordinating services between the two programs.

The Report recommends that SCE and SoCalGas contractors in the overlapping service territories enroll customers in both utilities' programs and that customers should be assessed for measures offered under both programs. The Report makes this recommendation on the assumption that this level of coordination would lead to cost efficiencies due to sharing of enrollment, outreach, energy education, and assessment costs across the two utilities. The major differences in the two programs are the high cost associated with electric measures (refrigerators, a/c units) and the number of homes serviced. As noted below, due to the differences between the two programs in the number of homes receiving service, the costs associated with providing comprehensive treatment, and the fact that many needy customers live outside the SoCalGas service area in hot climates with high cooling costs, these recommendations are unworkable. SCE is committed to maintaining a high degree of coordination with SoCalGas and its installation contractors as is feasible and in the best interest of all of its customers.

In 2003, SCE has initiated operational changes that maximize efficiency opportunities between the two utility programs while assuring that SCE can comply with Commission direction (Decision 02-12-019, Ordering Paragraph 2) that utilities "…shall manage their authorized budgets for PY2003 in a manner that maintains program service throughout the year." The Report's recommendation that would require all low-income customers serviced by SoCalGas be enrolled in SCE's program should be eliminated, given the adverse effect it would have on SCE's ability to manage its budget and deliver these important services to SCE's low-income customers throughout its entire service territory.

Within the context of the above comments, SCE provides comments on specific sections of the Report.

Section E.2.3 Providing Comprehensive Treatment to LIEE Program Participants

The introduction of new Rapid Deployment measures and the requirement for comprehensive delivery of service has created a significant disparity between SCE and SoCalGas in the cost of providing comprehensive services per home. For a given home

with gas space heating, SoCalGas may spend an average of $370 per home for weatherization services. For the same home on the other hand, SCE may spend as much as $500 just for a refrigerator. If a high-cost electric measure, such as a central air conditioner replacement, is installed, SCE may spend thousands of dollars on this home. Thus, it is not difficult to see that SCE would quickly deplete its budget if SCE would implement the Report's recommendation that SoCalGas' contractors *enroll* all 42,000+ homes that SoCalGas plans to weatherize each year into SCE's program. Under such a scenario, not only would SCE be unable to deliver services to all SoCalGas weatherization customers, but funding would be sufficiently depleted to provide little if any meaningful service to other customers who reside in the extreme climate areas outside of the overlapping service territories.

Because of this essential difference in the programs, SCE must retain management controls to regulate the workflow of homes being enrolled in a manner that complements existing program resources. SCE acknowledges that some opportunities may exist to increase coordination above our already high levels of program coordination. SCE is currently developing agreements with SoCalGas Weatherization contractors for electric measure assessment for customers in the overlap areas. By carefully managing the workflow of this assessment process, SCE should be able to retain sufficient resources to direct services to eligible customers in hot dry climates with high cooling loads. Another way of reducing the disparity in the number of homes that can be treated would be to limit the eligibility for high-cost cooling measures to specific climate zones, as has been suggested by the LIEE Standardization Team.

SCE's program structure has been revised so that any customer receiving a single measure under SCE's 2003 program will be assessed for eligibility and will receive all electric related measures to which they are entitled. SCE controls the number of customers that are enrolled in SCE's program to ensure that customers receive the comprehensive delivery of all feasible measures, including high-cost measures.

Section 4.3.2 Potential Drawbacks and Section 5.3 Increasing Consistency of Treatment Across the State

The Report predicts that SCE should be able to offset the reduced number of customers it can now serve under comprehensive treatment due to savings with outreach costs. Under agreements SCE is now finalizing with SoCalGas contractors, savings associated with outreach, income eligibility certification, energy education, and assessment will be realized, consistent with Report expectations. However, assessment savings will be minimal, since SCE will be required to pay contractors for additional activities associated with inspecting homes for electric appliance needs.

The Report properly recognizes that there may be drawbacks that could outweigh the cost-effectiveness that may be obtained through closer coordination. As noted above, although SCE supports closer coordination with SoCalGas on outreach, assessment and

customer education, SCE disagrees with the recommendation of enrollment for all customers given the severe drawbacks such a process would have on SCE's Program.

The Report recommends that SCE and SoCalGas contractors in the combined territory enroll customers in both utilities' programs and states this level of coordination would lead to cost efficiencies due to sharing of enrollment, outreach, energy education, and assessment costs across the two utilities. As noted throughout these comments, due to the vast differences between the two programs in the number of homes receiving LIEE services and the costs associated with providing comprehensive treatment, this recommendation is not feasible.

Conclusion

SCE appreciates the opportunity to provide these comments and believes that these comments enhance the efforts already undertaken to provide a high level of service to low-income customers.

Workshop Attachment B:
PY2001 LIEE Program Evaluation Final Results Workshop Presentation



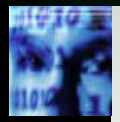



Evaluation of Low Income Energy Efficiency (LIEE) Program: PY2001 and Rapid Deployment

Clients:
SCE, SDG&E, SCG and PG&E

Pacific Energy Center
San Francisco, CA
March 26, 2003

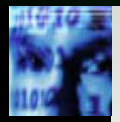
KEMA



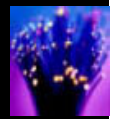



Agenda

- Introductions (5 minutes)
- Overview (5 minutes)
- Volume 1: Impact Evaluation (5 minutes)
  - Comments (10 minutes)
- Volume 2: Process Evaluation (10 minutes)
  - Comments (15 minutes)
- Summary of Comments (5 minutes)
- Adjourn

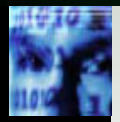




Introductions

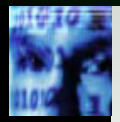
- KEMA-XENERGY
  - Kathleen Gaffney, Project Manager
  - Fred Coito, Impact Evaluation Lead
  - Tami Rasmussen, Process Evaluation Lead
- Utility Staff
- Energy Division Staff
- Others



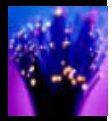



Overview

- Evaluation includes both process and impact components
- Follow-up on PY2000 evaluation
- Includes results and experiences from PY2001 and Rapid Deployment

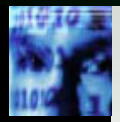




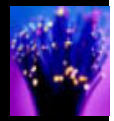



Impact Evaluation

- Measures
- Evaluation Approach
- Overall Results

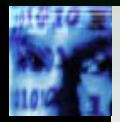




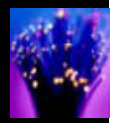



PY2001 Measures

- Evaporative cooler installation (permanent or portable)
- Relamping
- Weatherization
- Energy education
- Refrigerator replacement
- Porch lamp fixture replacement
- Furnace repair and replacement

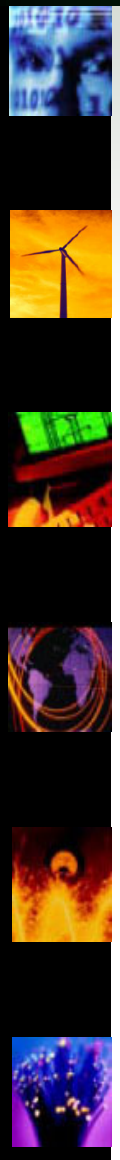




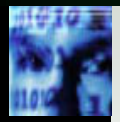
Rapid Deployment Measures

- Central and window/wall AC
- Duct sealing and repair
- Whole-house fans
- Water heaters
- Setback thermostats
- Evaporative cooler maintenance
- Measures for renters (evaporative coolers, air conditioners, water heaters, refrigerators, and hard-wired lighting fixtures)

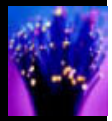


Approach

- Billing analysis of monthly household electricity and natural gas consumption, both before and after program intervention
- Engineering-based program savings variables were incorporated into the analysis for some measures

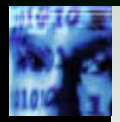




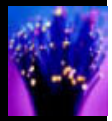



Overall Results

Impact Category	Utility				Total
	PG&E	SCE	SCG	SDG&E	
Non Weather Sensitive kWh Impacts	7,484,499	16,942,327		4,502,875	28,929,700
Space Heating kWh Impacts	171,099	54,807		28,855	254,761
Space Cooling kWh Impacts	1,349,205	1,889,973		59,814	3,298,992
Total kWh Impacts	**9,004,803**	**18,887,106**		**4,591,544**	**32,483,453**
Non Weather Sensitive Therm Impacts	291,836		451,009	98,739	841,585
Space Heating Therm Impacts	388,884		289,398	183,882	862,164
Total Therm Impacts	**680,720**		**740,407**	**282,621**	**1,703,749**

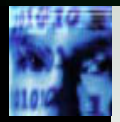




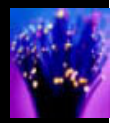



Process Evaluation

- Background / Approach
- Findings & Recommendations

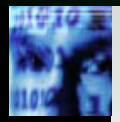




Background / Approach

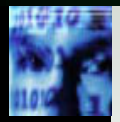
- Major evaluation activities conducted early to mid-2002
  - Staff/contractor interviews
  - Contractor “ride alongs” and site visits to training facilities
  - Program materials review
- Findings presented in August 2002 public workshop
  - Some issues were addressed in PY2002 or PY2003






Background / Approach

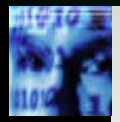
- Recent activities:
  - Participant surveys
  - Final Report



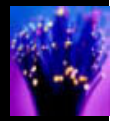



Findings & Recommendations

- Rapid Deployment
- Standardization
- Comprehensive & Coordinated Treatment
- Program Administration
- Outreach and Education
- Program Measures

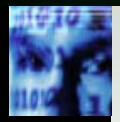




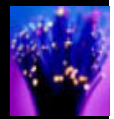



Rapid Deployment

- Utilities successful in expanding efforts
- Some contractors reported problems with some measures
- Customers satisfied with new measures

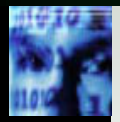




Standardization

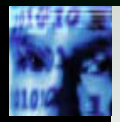
- Contractors have incorporated Statewide P&P and WIS
- Recommendations:
  - Allow some flexibility
  - Solicit contractor feedback
  - Reconsider income documentation requirement



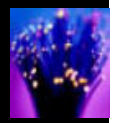



Comprehensive & Coordinated Treatment

- Benefits: increased statewide consistency and efficiency
- Drawback: with fixed budgets, fewer households are treated overall
- Recommendations:
  - Assess each eligible LIEE participant for all measures offered
  - Consider adding coordinated gas/electric assessment and referral processes where IOUs overlap

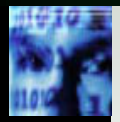




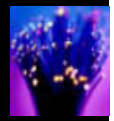



Program Administration

- Administrative and implementation models are well tested
- Recommendation:
  - Assess PG&E administrative performance post-transition period

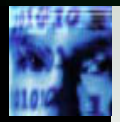




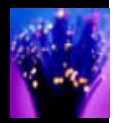



Outreach and Education

- Mix of contractors, CARE enrollment, and referrals add value
- Improvements to energy education well received
- Recommendations:
  - Continue to leverage, target
  - Formalize comprehensive education
  - Ensure customer understanding





Program Measures

- CFL hours of use
- Appliance replacement eligibility
- Refrigerator grounding expense
- Cost-effectiveness of sunscreens
- Education on use of programmable thermostats