San Diego Gas & Electric
Marketing Programs & Planning
8306 Century Park Court
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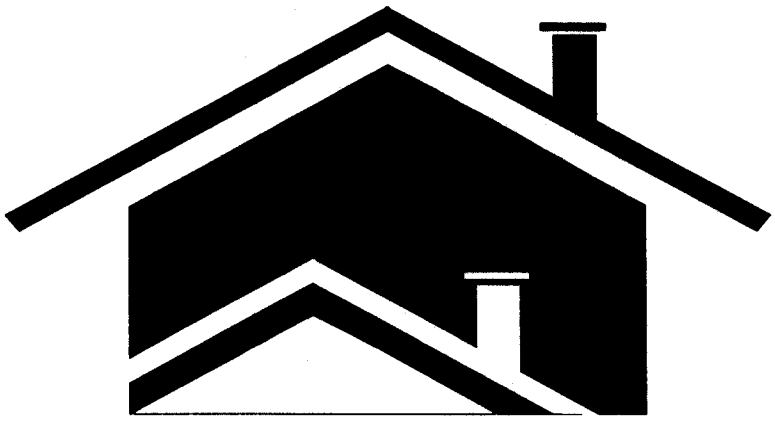
1994 Residential New Construction Program

First Year Load Impact Evaluation

February 1996



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Executive Summary

The Residential New Construction (RNC) Program is intended to encourage new home builders to incorporate energy saving building technologies and to install energy efficient measures and appliances, both of which exceed Title 24 State Building Energy Efficiency Standards by a minimum of five percent. This study calculates the net load impacts for space heating, space cooling, and water heating by subtracting the Unit Energy Consumption's (UEC's) of program participants from the UEC's of the comparison group.

The methodology of this study estimates the net effects directly without estimating the gross impacts. Therefore, the traditional net-to-gross (NTG) ratio definition is not applicable to this analysis. In order to estimate the NTG ratios for this study, building simulations are utilized. In this analysis, the NTG ratio is defined as 1 minus the nonparticipants' compliance over Title 24 State Building Energy Efficiency Standards. The estimated load impacts and net-to-gross ratios are shown in the following table.

TABLE 1
Net-to-Gross Ratios and Annual Savings for
1994 Residential New Construction Program Participants (SFDU)

End Use	Net-to-Gross Ratio	Annual kWh Savings	Peak kW Savings	Annual Therm Savings
Space Heating	1.10	100	0	33
Space Cooling	.81	187	.36	N/A
Water Heating	.99	Insufficient Data	Insufficient Data	-11

For additional savings verification, this study also utilizes building simulations from the participants and a sample of nonparticipants. On average, the home builders participating in SDG&E's program exceeded Title 24 requirements by over 14%, while the nonparticipants exceeded Title 24 requirements by over 3.5%. Therefore, the building simulation comparisons show that participation in the 1994 SDG&E Residential New Construction Program increased energy efficiency by nearly 11% over nonparticipants in the program.

Introduction

Program Overview

The 1994 Residential New Construction Program was intended to encourage new home builders to incorporate energy saving building technologies and to install energy efficient measures and appliances, both of which exceeded Title 24 State Building Energy Efficiency Standards. By so doing, developers were able to take advantage of conservation opportunities at the optimum time. All residential builders who exceeded space cooling, space heating, or water heating standards of Title 24 by a minimum of five percent were eligible to participate in the program. A dual approach was used to encourage builders to participate in the program:

1. Financial incentives were offered to builders to help offset additional costs of installing the more energy-efficient measures, e.g., window shading and high-efficiency air conditioning. An incentive structure for measures installed in either coastal or inland climate zones was established. Although Title 24 served as the program guideline, builders also were considered for financial incentives for the installation of cost-effective measures outside of Title 24 regulations. Unique situations were handled on a case-by-case basis.
2. An advertising campaign was used to develop potential homeowners' and nonparticipating builders' awareness of the program, increase general customer energy awareness, and recognize builders who were participating in the program. Emphasis was placed on the value of an energy efficient home as a long-term personal investment and on the positive environmental impacts of energy efficiency.

In the first quarter of 1994, the program was evaluated due to concerns about potential non cost-effectiveness. The results of the evaluation confirmed that the program was not cost effective. In May 1994, the findings were presented to SDG&E's DSM Advisory Committee with a recommendation to terminate the program. The Committee agreed to termination by year-end. All proactive selling of the program was discontinued to allow the program to wind down by the end of the year.

In 1995, the program continued in a "maintenance" mode in order to fulfill obligations to builders with outstanding contracts. This "maintenance" program will continue through 1996.

"Miscellaneous measures" are not addressed in this report. These items include compact fluorescent fixtures and all measures installed in multi-family dwellings. The M&E Protocol requirements for miscellaneous measures require the completion of first, fourth, and ninth year retention studies. It is reasonable to believe that since these homes are new, no significant renovations are being done that would cause measures to be removed in the first year. Therefore, SDG&E requested and received a retroactive waiver for the first year retention study, a copy of which is attached to the end of this report.

Sampling & Data Collection

Various sources of data were utilized in this analysis, including:

1. Building simulations for samples of program participants and nonparticipants;
2. Customer name, address, and participation date from the program tracking database;
3. Residential appliance saturation surveys for samples of program participants and nonparticipants;
4. Electric and gas consumption history from the Customer Master File, as well as the source for the nonparticipant comparison group; and
5. Hourly weather data for two climate zones from NOAA files.

Participant Sample - Load Impact Analysis

For the load impact analysis, the 1,732 participants in the 1994 Residential New Construction Program are defined as having signed an agreement after July 1993, and completed construction in calendar year 1994. After eliminating participants with missing or duplicate account numbers and merging with the Customer Master File, there were 1,310 participants for analysis. Further screening to eliminate files with missing names, names of

building developers (i.e., unoccupied sites), and having the last month of consumption of at least 10 kWh (another occupancy check), left a list of 923 participants. These 923 participants were asked to complete SDG&E's residential energy use survey, known as the MIRACLE survey (Marketing Information Research and Customer Load Estimate). The MIRACLE survey provides detailed information about household characteristics, appliance saturation levels, conservation measures adopted, and energy use practices.

Of the 923 participants who received a MIRACLE survey, 450 completed it. One question on the survey asks the year the house was built; 427 responded that their home was built in 1994. In order to analyze these customers in accordance with the M&E Protocols, nine months of consumption after the DSM installation is required, further lowering the analytical sample to 360 participants. Finally, the M&E Protocols for residential new construction concerns only single family dwelling units, leaving a participant database of 309 for analysis purposes.

Nonparticipant Sample - Load Impact Analysis

The M&E Protocols require a nonparticipant sample of the Residential New Construction Program as a comparison group. The comparison group sample was developed from SDG&E's Customer Master File with a "meter set date" (date the meter was originally placed in service) and "meter turn on date" (the date service was established in the current customer's name) both of which were in calendar year 1994. From this filtered group, a random sample of 1,300 was selected. After eliminating participants and names of building developers (i.e., vacant sites) from the sample, the remaining 1,187 nonparticipants were asked to fill out the MIRACLE survey, of which 516 responded. Screening on the responses lowered our nonparticipant sample for comparative analysis as follows: 421 responded that their home was built in 1994; the 421 was lowered to 363 in order to satisfy the nine months of consumption data requirement, and out of this subset, 272 responded that their home is a single family dwelling unit, thus creating the nonparticipant database for analysis purposes.

The Econometric Framework

The load impact analysis estimates the net impact directly without estimating the gross impact. This is done through the regression models described below.

Electricity Model

The electricity consumption model was designed to take advantage of variation in weather over time (with months indexed by t), which allows the regression model to yield estimates of weather-related consumption for individual customers (indexed by i):

Equation 1 (The Customer-Specific Electricity Consumption Model)

$$kWh_{it} = \alpha_i + \beta_i^c(cdh_{it}) + \beta_i^h(hdh_{it}) + \varepsilon_{it}$$

The parameter α_i represents all the static elements of household electricity consumption, such as refrigeration. The remaining two regression components in Equation 1 are the cooling and heating elements based on cooling

degreehours (cdh_{it}) and heating degreehours (hdh_{it}), respectively. The regression equation contains the usual random disturbance term ε_{it}.

Equation 1 was estimated at the customer level using ordinary least-squares. When it was known that a particular customer was without either space cooling or space heating, the appropriate coefficient (either β_i^c or β_i^h) was constrained to zero. The annual weather-normalized consumption averages for cooling and heating (found in Table 2) can be calculated for both participants and nonparticipants based on long-term averages $\overline{cdh_i}$ and $\overline{hdh_i}$:

Equation 2 (Estimated Annual Cooling Consumption, per Household)

$$\bar{c} = 12 \times \frac{\sum_i \beta_i^c \left(\overline{cdh_i}\right)}{n}$$

Equation 3 (Estimated Annual Heating Consumption, per Household)

$$\bar{h} = 12 \times \frac{\sum_i \beta_i^h \left(\overline{hdh_i}\right)}{n}$$

Gas Model

The gas model follows the structure of the electricity model, although a second phase is added to the estimation process.

Phase 1 of the Gas Model

Equation 4 (The Customer-Specific Gas Consumption Model--Phase 1)

$$therms_{it} = \alpha_i + \beta_i^h \left(hdh_{it}\right) + \varepsilon_{it}$$

This regression equation (estimated at the customer level using ordinary least-squares) allows for the construction of an expression identical to Equation 3 for therms. The annual weather-normalized consumption averages are provided in Table 2 for participants and nonparticipants.

Phase 2 of the Gas Model

Phase 2 of the gas model involves identifying the individual elements of static consumption. To do this, a regression equation is formed with static consumption α_i (from Phase 1) as the dependent variable:

Equation 5 (The Elements of Static Gas Usage)

$$\alpha_i = WH_i + CD_i + RNG_i + SPA_i + \eta_i$$

The independent variables are associated with gas water heaters (WH), gas clothes dryers (CD), gas ranges (RNG), and gas-heated spas (SPA). The exact specifications for these end uses are given by,

$$WH_i = \gamma_1^{WH}\left(d_i^{WH}\right) + \gamma_2^{WH}\left(d_i^{WH}\right)(nhh_i) + \gamma_3^{WH}\left(d_i^{WH}\right)\left(d_i^{DW}\right)(nhh_i) + \gamma_4^{WH}\left(d_i^{WH}\right)\left(d_i^{CW}\right)(nhh_i)$$

$$CD_i = \gamma_1^{CD}\left(d_i^{CD}\right) + \gamma_2^{CD}\left(d_i^{CD}\right)(nhh_i)$$

$$RNG_i = \gamma_1^{RNG}\left(d_i^{RNG}\right) + \gamma_2^{RNG}\left(d_i^{RNG}\right)(nhh_i) + \gamma_2^{RNG}\left(d_i^{RNG}\right)\left(d_i^{MIC}\right)(nhh_i)$$

$$SPA_i = \gamma_1^{SPA}\left(d_i^{SPA}\right) + \gamma_1^{SPA}\left(d_i^{SPA}\right)(income_i)$$

Here d_i^K is a simple zero-one indicator variable for end use K, nhh_i is the number of members in household i, and $income_i$ is household income. The water heater component contains both a dishwasher and clothes washer interaction. Similarly, the range term contains a microwave oven interaction term. The γ 's themselves are the regression coefficients in the final regression equation, which is purely cross-sectional in nature.

Once the model is estimated (for both participants and nonparticipants, using ordinary least-squares), the average water heater element can be calculated:

Equation 6 (Gas Water Heater Usage--Annual Therms)

$$\overline{WH} = 12 \times \left\{\gamma_1^{WH} + \gamma_2^{WH}\left(\overline{nhh}\right) + \gamma_3^{WH}\overline{\left(d_i^{DW}\right)(nhh_i)} + \gamma_4^{WH}\overline{\left(d_i^{CW}\right)(nhh_i)}\right\}$$

The results for Equation 6 are also contained in Table 2.

Results

The methodology described produced the following UEC's for the participants and nonparticipants:

TABLE 2
Estimated Annual UEC's for 1994 Residential New Construction

End Use	Participants (SFDU)		Nonparticipants (SFDU)	
	kWh	Therms	kWh	Therms
Space Heating	1,107	241	1,207	274
Space Cooling	1,170	N/A	1,357	N/A
Water Heating	Insufficient Data	103	Insufficient Data	92

Energy Savings Estimates

The savings estimate were calculated by subtracting the UEC's of the participant group from the UEC's of the nonparticipant group. For single family dwelling units, the annual savings for space cooling are 187 kWh, for space heating the savings are 100 kWh for electricity and 33 therms for natural gas. For water heating, the savings are a negative 11 therms for gas water heaters. Conclusive results of an estimate of electric water heating savings cannot be drawn due to extremely small sample sizes (8 participants, 10 nonparticipants). Complete savings

estimates, including confidence intervals and the various designated units of measurements are provided in M&E Protocols Table 6 of this report.

Capacity Savings Estimates

In order to estimate the capacity (kW) savings, peak factors (ratio of demand coincident with system peak to annual consumption) were multiplied by the load impacts. The peak factors were developed by SDG&E in preparing the Residential UEC Study in 1995. The peak factors are .00192 for space cooling, .00005721 for electric water heaters, and 0 for space heating. These factors are applied to the energy savings reported in M&E Protocols Table 6 and appear in the capacity savings portion of that Table. In general, a single family dwelling unit in the 1994 RNC program saved .36 kW for space cooling and 0 kW for space heating. Conclusive results of capacity savings for electric water heaters cannot be drawn due to the small sample sizes (8 participants, 10 nonparticipants).

Summary of Results

The following table summarizes the savings associated with participants in the 1994 Residential New Construction Program for single family dwelling units.

TABLE 3
Savings for 1994 Residential New Construction Program Participants (SFDU)

	Annual kWh Savings	Peak kW Savings	Annual Therm Savings
Space Heating	**100**	**0**	**33**
Space Cooling	**187**	**.36**	**N/A**
Water Heating	**Insufficient Data**	**Insufficient Data**	**-11**

Building Simulation Comparisons

In an effort to supplement the above findings and to calculate a net-to-gross estimates, SDG&E conducted a set of building simulations. To participate in SDG&E's Residential New Construction Program, builders must submit their Title 24 building simulation compliance reports and a building simulation with the proposed energy efficiency enhancements (SDG&E requires the CEC approved MICROPAS4 building simulation model). If this enhanced simulation surpasses Title 24 State Building Energy Efficiency Standards by at least 5%, then the project is eligible for participation.

The enhanced building simulation documentation is the basis for the participant sample. Building simulations representing 1,119 participant lots were analyzed. This group passed the simple criteria of signing contracts and completing the projects in 1994 (contracts signed prior to 1994 and/or not completed by the end of 1994 were excluded for comparison purposes.) On average, this group of participants exceeded Title 24 requirements by over 14%.

A sample of 46 nonparticipants was randomly selected from the 272 nonparticipants in the database described in the Nonparticipant Sample - Load Impact Analysis section as representative of residential new construction customers who did not the participate in SDG&E's 1994 Residential New Construction Program. This group was defined as having a home built and completed in 1994. These nonparticipants had building simulations run after completion of on-site audits. On average, this group of nonparticipants exceeded Title 24 requirements by over 3.5%.[1] Therefore, the building simulation comparisons as shown in Table 4 indicate that participation in the 1994 SDG&E Residential New Construction Program increased energy efficiency by nearly 11% over nonparticipants in the program.

TABLE 4
Building Simulation (MICROPAS4) Comparisons

1994 RNC PARTICIPANTS							
				Percentage Over Title 24 Standards			
CliZone	# of Lots	Tot Sq Ft	Avg Sq Ft	Heat	Cool	Water	Total
7	807	1,415,320	1,754	14.23%	26.68%	12.55%	15.94%
10	312	548,488	1,758	15.37%	4.40%	12.87%	10.17%
Combined	1,119	1,963,808	1,755	14.55%	20.46%	12.64%	14.33%
1994 RNC NONPARTICIPANTS							
				Percentage Over Title 24 Standards			
CliZone	# of Lots	Tot Sq Ft	Avg Sq Ft	Heat	Cool	Water	Total
7	33	63,237	1,916	-15.51%	29.09%	0.02%	4.71%
10	13	26,347	2,027	4.78%	-3.75%	3.52%	1.01%
Combined	46	89,584	1,947	-9.54%	19.43%	1.05%	3.62%
DIFFERENCE BETWEEN PARTICIPANTS AND NONPARTICIPANTS							
				Percentage Over Title 24 Standards			
CliZone	# of Lots	Tot Sq Ft	Avg Sq Ft	Heat	Cool	Water	Total
7	774	1,352,083	(162)	29.74%	-2.41%	12.53%	11.23%
10	299	522,141	(269)	10.59%	8.15%	9.35%	9.16%
Combined	1,073	1,874,224	(193)	24.09%	1.03%	11.59%	10.71%

[1] In a statewide study conducted for CADMAC, the compliance margin using July 1993 standards for a sample of 26 homes exceeded Title 24 by 3% in climate zone 10. The statewide average for compliance was -3%, both numbers being based on field audits. Berkeley Solar Group, 1993 Residential Field Data Project, Energy Characteristics, Code Compliance and Occupancy of California 1993 Title 24 Houses, April 30, 1995, p.1-11.

Net-to-Gross Ratios

The load impact analysis in this study estimates the net effects directly without estimating the gross impacts. Therefore, the traditional net-to-gross (NTG) ratio definition is not applicable to this analysis. In order to estimate the NTG ratios for this study, the building simulations are utilized. In this analysis, the NTG ratio is defined as 1 minus the nonparticipants' compliance over Title 24 State Building Energy Efficiency Standards, since the purpose of the Program is to get builders to install measures that exceed Title 24 Standards. The estimated net-to-gross ratios are shown in the following table.

TABLE 5
Estimated Net-to-Gross Ratios

(A) End Use	(B) Nonparticipant Compliance Over Title 24	(C) Net-to-Gross Ratio 1-(B)
Space Heating	-9.54%	1.10
Space Cooling	19.43%	.81
Water Heating	1.05%	.99

Measure Cost

Average incremental measure cost estimates for the Residential New Construction Program were based on SDG&E's customer cost-effectiveness analysis. For space cooling, the measure costs represent central air conditioning units. SDG&E administered air conditioner incentives through "per ton/SEER improvements," and the costs were recorded in this manner. Conversely, space heating and water heating improvements were included within "custom budgets" of the Residential New Construction Program, and those costs were tracked accordingly. The average incremental costs are shown in Table 6.

TABLE 6
1994 Residential New Construction Measure Costs

End Use	Average Incremental Costs
Space Heating	**$289.37 per Custom Budget (Electric and Gas)**
Space Cooling	**$34.32 per Ton/SEER improvement**
Water Heating (Gas only)	**$74.45 per Custom Budget (Gas Only)**

Suggested Changes to the Protocols

Having just completed this impact evaluation, SDG&E would like to take this opportunity to address an issue with regards to the M&E Protocols. The Residential New Construction first year retention study for miscellaneous measures should be dropped. The M&E Protocols for miscellaneous measures require the completion of first, fourth, and ninth year retention studies. It is reasonable to believe that since these homes are new, no significant renovations are being done that would cause measures to be removed in the first year. For program year 1994, SDG&E has requested and received a retroactive waiver for the first year retention study. SDG&E is now suggesting a change to the Protocols that would permanently eliminate the first year retention study.

M&E PROTOCOLS TABLE 6

RESULTS USED TO SUPPORT PY94 SECOND EARNINGS CLAIM

FOR

RESIDENTIAL NEW CONSTRUCTION PROGRAM FIRST YEAR LOAD IMPACT EVALUATION

FEBRUARY 1996

STUDY ID NO. 932

SAN DIEGO GAS & ELECTRIC

M&E PROTOCOLS TABLE 6 - RESULTS USED TO SUPPORT PY94 SECOND EARNINGS CLAIM FOR RESIDENTIAL NEW CONSTRUCTION PROGRAM

FIRST YEAR LOAD IMPACT EVALUATION, FEBRUARY 1996, STUDY ID NO. 932

Designated Unit of Measurement: LOAD IMPACTS PER SINGLE FAMILY DWELLING UNIT

END USE: SPACE COOLING

				5. A. 90% CONFIDENCE LEVEL				5. B. 80% CONFIDENCE LEVEL			
				LOWER BOUND	UPPER BOUND	LOWER BOUND	UPPER BOUND	LOWER BOUND	UPPER BOUND	LOWER BOUND	UPPER BOUND
1. Average Participant Group and Average Comaprison Group		**PART GRP**	**COMP GRP**	**PART GRP**	**PART GRP**	**COMP GRP**	**COMP GRP**	**PART GRP**	**PART GRP**	**COMP GRP**	**COMP GRP**
A. Pre-install usage:	Pre-install kW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Pre-install kWh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base kW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base kWh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base kW/ designated unit of measurement	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base kWh/ designated unit of measurement	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B. Impact year usage:	Impact Yr kW	2.2	2.6	2.1	2.4	2.5	2.7	2.2	2.3	2.5	2.7
	Impact Yr kWh	1,170	1,357	1,108	1,232	1,294	1,420	1,122	1,218	1,308	1,406
	Impact Yr kW/designated unit	2.2	2.6	2.1	2.4	2.5	2.7	2.2	2.3	2.5	2.7
	Impact Yr kWh/designated unit	1,170	1,357	1,108	1,232	1,294	1,420	1,122	1,218	1,308	1,406
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	N/A	0.36	N/A	N/A	0.2	0.5	N/A	N/A	0.2	0.5
	A. ii. Load Impacts - kWh	N/A	187	N/A	N/A	99	275	N/A	N/A	118	256
	B. i. Load Impacts/designated unit - kW	N/A	0.36	N/A	N/A	0.2	0.5	N/A	N/A	0.2	0.5
	B. ii. Load Impacts/designated unit - kWh	N/A	187	N/A	N/A	99	275	N/A	N/A	118	256
	C. i. a. % change in usage - Part Grp - kW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C. i. b. % change in usage - Part Grp - kWh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C. ii. a. % change in usage - Comp Grp - kW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C. ii. b. % change in usage - Comp Grp - kWh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D. Realization Rate:	D.A. i. Load Impacts - kW, realization rate	N/A	71%	N/A	N/A	40%	101%	N/A	N/A	47%	95%
	D.A. ii. Load Impacts - kWh, realization rate	N/A	89%	N/A	N/A	50%	127%	N/A	N/A	59%	118%
	D.B. i. Load Impacts/designated unit - kW, real rate	N/A	71%	N/A	N/A	40%	101%	N/A	N/A	47%	95%
	D.B. ii. Load Impacts/designated unit - kWh, real rate	N/A	89%	N/A	N/A	50%	127%	N/A	N/A	59%	118%
3. Net-to-Gross Ratios		**RATIO**		**RATIO**	**RATIO**			**RATIO**	**RATIO**		
	A. i. Average Load Impacts - kW	81%		81%	81%			81%	81%		
	A. ii. Average Load Impacts - kWh	81%		81%	81%			81%	81%		
	B. i. Avg Load Impacts/designated unit of measurement - kW	81%		81%	81%			81%	81%		
	B. ii. Avg Load Impacts/designated unit of measurement - kWh	81%		81%	81%			81%	81%		
	C. i. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - kW	N/A		N/A	N/A			N/A	N/A		
	C. ii. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - kWh	N/A		N/A	N/A			N/A	N/A		
4. Designated Unit Intermediate Data		**PART GRP**	**COMP GRP**	**PART GRP**	**PART GRP**	**COMP GRP**	**COMP GRP**	**PART GRP**	**PART GRP**	**COMP GRP**	**COMP GRP**
	A. Pre-install average value	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	B. Post-install average value	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6. Measure Count Data		**NUMBER**	**INC COST**								
	A. Number of measures installed by participants in Part Group (CENTRAL A/C's)	168									
	B. Number of measures installed by all program participants in the 12 months of the program year (CENTRAL A/C's)	591	$34.32 per ton SEER								
	C. Number of measures installed by Comp Group (CENTRAL A/C's)	164									
7. Market Segment Data		**CZone 7**	**CZone 10**								
	Number of Participants	194	397								

NOTE: Net-to-gross ratio determined from building simulations and defined as 1 minus the percentage nonparticipants exceed Title 24 Compliance requirements

SAN DIEGO GAS & ELECTRIC

M&E PROTOCOLS TABLE 6 - RESULTS USED TO SUPPORT PY94 SECOND EARNINGS CLAIM FOR RESIDENTIAL NEW CONSTRUCTION PROGRAM

FIRST YEAR LOAD IMPACT EVALUATION, FEBRUARY 1996, STUDY ID NO. 932

Designated Unit of Measurement: LOAD IMPACTS PER SQUARE FOOT

END USE: SPACE COOLING

				5. A. 90% CONFIDENCE LEVEL				5. B. 80% CONFIDENCE LEVEL			
				LOWER BOUND	UPPER BOUND	LOWER BOUND	UPPER BOUND	LOWER BOUND	UPPER BOUND	LOWER BOUND	UPPER BOUND
1. Average Participant Group and Average Comaprison Group		PART GRP	COMP GRP	PART GRP	PART GRP	COMP GRP	COMP GRP	PART GRP	PART GRP	COMP GRP	COMP GRP
A. Pre-install usage:	Pre-install kW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Pre-install kWh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base kW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base kWh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base kW/ designated unit of measurement	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base kWh/ designated unit of measurement	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B. Impact year usage:	Impact Yr kW	2.2	2.6	2.1	2.4	2.5	2.7	2.2	2.3	2.5	2.7
	Impact Yr kWh	1,170	1,357	1,108	1,232	1,294	1,420	1,122	1,218	1,308	1,406
	Impact Yr kW/designated unit	0.00103	0.00110	0.00098	0.00109	0.00105	0.00116	0.00099	0.00108	0.00106	0.00115
	Impact Yr kWh/designated unit	0.539	0.575	0.512	0.566	0.548	0.603	0.518	0.560	0.554	0.597
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	N/A	0.36	N/A	N/A	0.2	0.5	N/A	N/A	0.2	0.5
	A. ii. Load Impacts - kWh	N/A	187	N/A	N/A	99	275	N/A	N/A	118	256
	B. i. Load Impacts/designated unit - kW	N/A	0.00007	N/A	N/A	0.00000	0.00014	N/A	N/A	0.00001	0.00013
	B. ii. Load Impacts/designated unit - kWh	N/A	0.037	N/A	N/A	-0.002	0.075	N/A	N/A	0.007	0.067
	C. i. a. % change in usage - Part Grp - kW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C. i. b. % change in usage - Part Grp - kWh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C. ii. a. % change in usage - Comp Grp - kW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C. ii. b. % change in usage - Comp Grp - kWh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D. Realization Rate:	D.A. i. Load Impacts - kW, realization rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	D.A. ii. Load Impacts - kWh, realization rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	D.B. i. Load Impacts/designated unit - kW, real rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	D.B. ii. Load Impacts/designated unit - kWh, real rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3. Net-to-Gross Ratios		RATIO		RATIO	RATIO			RATIO	RATIO		
	A. i. Average Load Impacts - kW	81%		81%	81%			81%	81%		
	A. ii. Average Load Impacts - kWh	81%		81%	81%			81%	81%		
	B. i. Avg Load Impacts/designated unit of measurement - kW	81%		81%	81%			81%	81%		
	B. ii. Avg Load Impacts/designated unit of measurement - kWh	81%		81%	81%			81%	81%		
	C. i. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - kW	N/A		N/A	N/A			N/A	N/A		
	C. ii. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - kWh	N/A		N/A	N/A			N/A	N/A		
4. Designated Unit Intermediate Data		PART GRP	COMP GRP	PART GRP	PART GRP	COMP GRP	COMP GRP	PART GRP	PART GRP	COMP GRP	COMP GRP
	A. Pre-install average value	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	B. Post-install average value SQUARE FOOTAGE	2171	2358	2141	2201	2329	2387	2148	2194	2335	2381
6. Measure Count Data		NUMBER	INC COST								
	A. Number of measures installed by participants in Part Group (CENTRAL A/C's)	168									
	B. Number of measures installed by all program participants in the 12 months of the program year (CENTRAL A/C's)	591	$34.32 per ton SEER								
	C. Number of measures installed by Comp Group (CENTRAL A/C's)	164									
7. Market Segment Data		CZone 7	CZone 10								
	Number of Participants	194	397								

NOTE: Net-to-gross ratio determined from building simulations and defined as 1 minus the percentage nonparticipants exceed Title 24 Compliance requirements

NOTE: The standard error associated with the confidence intervals for the designated unit of measurement is calculated from the standard error of the individual ratios of load impact/square footage

NOTE: There is no *ex ante* estimate for this DUOM, therefore, there is no realizarion rate

SAN DIEGO GAS & ELECTRIC

M&E PROTOCOLS TABLE 6 - RESULTS USED TO SUPPORT PY94 SECOND EARNINGS CLAIM FOR RESIDENTIAL NEW CONSTRUCTION PROGRAM

FIRST YEAR LOAD IMPACT EVALUATION, FEBRUARY 1996, STUDY ID NO. 932

Designated Unit of Measurement LOAD IMPACTS PER SINGLE FAMILY DWELLING UNIT

END USE: SPACE HEATING

				5. A. 90% CONFIDENCE LEVEL				5. B. 80% CONFIDENCE LEVEL			
				LOWER BOUND	UPPER BOUND	LOWER BOUND	UPPER BOUND	LOWER BOUND	UPPER BOUND	LOWER BOUND	UPPER BOUND
1. Average Participant Group and Average Comaprison Group		PART GRP	COMP GRP	PART GRP	PART GRP	COMP GRP	COMP GRP	PART GRP	PART GRP	COMP GRP	COMP GRP
A. Pre-install usage:	Pre-install kW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Pre-install kWh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Pre-install Therms	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base kW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base kWh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base Therms	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base kW/ designated unit of meesurement	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base kWh/ designated unit of meesurement	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base Therms/ designated unit of measurement	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B. Impact year usage:	Impact Yr kW	0	0	0	0	0	0	0	0	0	0
	Impact Yr kWh	1,107	1,207	867	1,347	967	1,447	920	1,294	1,020	1,394
	Impact Yr Therms	241	274	236	246	269	279	237	245	270	278
	Impact Yr kW/designated unit	0	0	0	0	0	0	0	0	0	0
	Impact Yr kWh/designated unit	1,107	1,207	867	1,347	967	1,447	920	1,294	1,020	1,394
	Impact Yr Therms/designated unit	241	274	236	246	269	279	237	245	270	278
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	N/A	0	N/A	N/A	0.0	0.0	N/A	N/A	0.0	0.0
	A. ii. Load Impacts - kWh	N/A	100	N/A	N/A	-240	440	N/A	N/A	-165	365
	A. iii. Load Impacts - Therms	N/A	33	N/A	N/A	26	40	N/A	N/A	27	39
	B. i. Load Impacts/designated unit - kW	N/A	0	N/A	N/A	0.0	0.0	N/A	N/A	0	0
	B. ii. Load Impacts/designated unit - kWh	N/A	100	N/A	N/A	-240	440	N/A	N/A	-165	365
	B. iii. Load Impacts/designated unit - Therms	N/A	33	N/A	N/A	26	40	N/A	N/A	27	39
	C. i. a. % change in usage - Part Grp - kW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C. i. b. % change in usage - Part Grp - kWh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C. i. c. % change in usage - Part Grp - Therms	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C. ii. a. % change in usage - Comp Grp - kW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C. ii. b. % change in usage - Comp Grp - kWh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C. ii. c. % change in usage - Comp Grp - Therms	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D. Realization Rate:	D.A. i. Load Impacts - kW, realization rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	D.A. ii. Load Impacts - kWh, realization rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	D.A. iii. Load Impacts - Therms, realization rate	N/A	80%	N/A	N/A	63%	98%	N/A	N/A	67%	94%
	D.B. i. Load Impacts/designated unit - kW, real rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	D.B. ii. Load Impacts/designated unit - kWh, real rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	D.B. iii. Load Impacts/designated unit - Therms, real rate	N/A	80%	N/A	N/A	63%	98%	N/A	N/A	67%	80%
3. Net-to-Gross Ratios		RATIO		RATIO	RATIO			RATIO	RATIO		
	A. i. Average Load Impacts - kW	110%		109%	110%			109%	110%		
	A. ii. Average Load Impacts - kWh	110%		109%	110%			109%	110%		
	A. iii. Average Load Impacts - Therms	110%		109%	110%			109%	110%		
	B. i. Avg Load Impacts/designated unit of measurement - kW	110%		109%	110%			109%	110%		
	B. ii. Avg Load Impacts/designated unit of measurement - kWh	110%		109%	110%			109%	110%		
	B. iii. Avg Load Impacts/designated unit of measurement - Therms	110%		109%	110%			109%	110%		
	C. i. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - kW	N/A		N/A	N/A			N/A	N/A		
	C. ii. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - kWh	N/A		N/A	N/A			N/A	N/A		
	C. iii. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - Thms	N/A		N/A	N/A			N/A	N/A		
4. Designated Unit Intermediate Data		PART GRP	COMP GRP	PART GRP	PART GRP	COMP GRP	COMP GRP	PART GRP	PART GRP	COMP GRP	COMP GRP
	A. Pre-install average value	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	B. Post-install average value	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6. Measure Count Data		NUMBER	INC COST								
	A. Number of measures installed by participants in Part Group (CENTRAL HEATING ONLY)	Electric 3 Gas 24									
	B. Number of measures installed by all program participants in the 12 months of the program year (CUSTOM BUDGET COUNTS - GAS & ELECTRIC)	3190	$289 37 per budget								
	C. Number of measures installed by Comp Group (CENTRAL HEATING ONLY)	Electric 1 Gas 18									
7. Market Segment Data		CZone 7	CZone 10								
	Number of Participants -Gas (BUDGET COUNT)	927	655								
	Number of Participants - Electric (BUDGET COUNT)	928	680								

NOTE: Net-to-gross ratio determined from building simulations and defined as 1 minus the percentage nonparticipants exceed Title 24 Compliance requirements

NOTE: There is no *ex ante* estimate for electric space heating, therefore, there is no realizarion rate

SAN DIEGO GAS & ELECTRIC

M&E PROTOCOLS TABLE 6 - RESULTS USED TO SUPPORT PY94 SECOND EARNINGS CLAIM FOR RESIDENTIAL NEW CONSTRUCTION PROGRAM

FIRST YEAR LOAD IMPACT EVALUATION, FEBRUARY 1996, STUDY ID NO. 932

Designated Unit of Measurement: LOAD IMPACTS PER SQUARE FOOT

END USE: SPACE HEATING

				5. A. 90% CONFIDENCE LEVEL				5. B. 80% CONFIDENCE LEVEL			
				LOWER BOUND	UPPER BOUND	LOWER BOUND	UPPER BOUND	LOWER BOUND	UPPER BOUND	LOWER BOUND	UPPER BOUND
1. Average Participant Group and Average Comaprison Group		**PART GRP**	**COMP GRP**	**PART GRP**	**PART GRP**	**COMP GRP**	**COMP GRP**	**PART GRP**	**PART GRP**	**COMP GRP**	**COMP GRP**
A. Pre-install usage:	Pre-install kW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Pre-install kWh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Pre-install Therms	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base kW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base kWh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base Therms	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base kW/ designated unit of measurement	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base kWh/ designated unit of measurement	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base Therms/ designated unit of measurement	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B. Impact year usage:	Impact Yr kW	0	0	0	0	0	0	0	0	0	0
	Impact Yr kWh	1,107	1,207	867	1,347	967	1,447	920	1,294	1,020	1,394
	Impact Yr Therms	241	274	236	246	269	279	237	245	270	278
	Impact Yr kW/designated unit	0	0	0	0	0	0	0	0	0	0
	Impact Yr kWh/designated unit	0.52514	0.58941	0.40123	0.64905	0.47426	0.70457	0.42857	0.62170	0.49967	0.67916
	Impact Yr Therms/designated unit	0.12076	0.12193	0.11843	0.12308	0.11966	0.12420	0.11895	0.12257	0.12016	0.12370
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	N/A	0	N/A	N/A	0.0	0.0	N/A	N/A	0	0
	A. ii. Load Impacts - kWh	N/A	100	N/A	N/A	-240	440	N/A	N/A	-165	365
	A. iii. Load Impacts - Therms	N/A	33	N/A	N/A	26	40	N/A	N/A	27	39
	B. i. Load Impacts/designated unit - kW	N/A	0	N/A	N/A	0.0	0.0	N/A	N/A	0.0	0.0
	B. ii. Load Impacts/designated unit - kWh	N/A	0.06427	N/A	N/A	-0.10488	0.23343	N/A	N/A	-0.06755	0.19610
	B. iii. Load Impacts/designated unit - Therms	N/A	0.00117	N/A	N/A	-0.00207	0.00442	N/A	N/A	-0.00136	0.00370
	C. i. a. % change in usage - Part Grp - kW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C. i. b. % change in usage - Part Grp - kWh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C. i. c. % change in usage - Part Grp - Therms	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C. ii. a. % change in usage - Comp Grp - kW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C. ii. b. % change in usage - Comp Grp - kWh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C. ii. c. % change in usage - Comp Grp - Therms	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D. Realization Rate:	D.A. i. Load Impacts - kW, realization rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	D.A. ii. Load Impacts - kWh, realization rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	D.A. iii. Load Impacts - Therms, realization rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	D.B. i. Load Impacts/designated unit - kW, real rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	D.B. ii. Load Impacts/designated unit - kWh, real rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	D.B. iii. Load Impacts/designated unit - Therms, real rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3. Net-to-Gross Ratios		**RATIO**		**RATIO**	**RATIO**			**RATIO**	**RATIO**		
	A. i. Average Load Impacts - kW	110%		109%	110%			109%	110%		
	A. ii. Average Load Impacts - kWh	110%		109%	110%			109%	110%		
	A. iii. Average Load Impacts - Therms	110%		109%	110%			109%	110%		
	B. i. Avg Load Impacts/designated unit of measurement - kW	110%		109%	110%			109%	110%		
	B. ii. Avg Load Impacts/designated unit of measurement - kWh	110%		109%	110%			109%	110%		
	B. iii. Avg Load Impacts/designated unit of measurement - Therms	110%		109%	110%			109%	110%		
	C. i. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - kW	N/A		N/A	N/A			N/A	N/A		
	C. ii. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - kWh	N/A		N/A	N/A			N/A	N/A		
	C. iii. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - Thms	N/A		N/A	N/A			N/A	N/A		
4. Designated Unit Intermediate Data		**PART GRP**	**COMP GRP**	**PART GRP**	**PART GRP**	**COMP GRP**	**COMP GRP**	**PART GRP**	**PART GRP**	**COMP GRP**	**COMP GRP**
	A. Pre-install average value	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	B. Post-install average value SQ FOOT (Electric)	2108	2048	2080	2136	2025	2070	2086	2130	2030	2065
	B. Post-install average value SQ FOOT (Gas)	1996	2247	1967	2025	2219	2276	1973	2018	2225	2269
6. Measure Count Data		**NUMBER**	**INC COST**								
	A. Number of measures installed by participants in Part Group (CENTRAL HEATING ONLY)	Electric 3 Gas 24									
	B. Number of measures installed by all program participants in the 12 months of the program year (CUSTOM BUDGET COUNTS - GAS & ELECTRIC)	3190	$289.37 per budget								
	C. Number of measures installed by Comp Group (CENTRAL HEATING ONLY)	Electric 1 Gas 18									
7. Market Segment Data		**CZone 7**	**CZone 10**								
	Number of Participants -Gas (BUDGET COUNT)	927	655								
	Number of Participants - Electric (BUDGET COUNT)	928	680								

NOTE: Net-to-gross ratio determined from building simulations and defined as 1 minus the percentage nonparticipants exceed Title 24 Compliance requirements

NOTE: The standard error associated with the confidence intervals for the designated unit of measurement is calculated from the standard error of the individual ratios of load impact/square footage

NOTE: There is no *ex ante* estimate for this DUOM, therefore, there is no realizarion rate

SAN DIEGO GAS & ELECTRIC

M&E PROTOCOLS TABLE 6 - RESULTS USED TO SUPPORT PY94 SECOND EARNINGS CLAIM FOR RESIDENTIAL NEW CONSTRUCTION PROGRAM

FIRST YEAR LOAD IMPACT EVALUATION, FEBRUARY 1996, STUDY ID NO. 932

Designated Unit of Measurement: LOAD IMPACTS PER SINGLE FAMILY DWELLING UNIT

END USE: WATER HEATING

				5. A. 90% CONFIDENCE LEVEL				5. B. 90% CONFIDENCE LEVEL			
				LOWER BOUND	UPPER BOUND	LOWER BOUND	UPPER BOUND	LOWER BOUND	UPPER BOUND	LOWER BOUND	UPPER BOUND
1. Average Participant Group and Average Comeprison Group		**PART GRP**	**COMP GRP**	**PART GRP**	**PART GRP**	**COMP GRP**	**COMP GRP**	**PART GRP**	**PART GRP**	**COMP GRP**	**COMP GRP**
A. Pre-install usage:	Pre-install kW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Pre-install kWh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Pre-install Therms	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base kW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base kWh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base Therms	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base kW designated unit of measurement	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base kWh/ designated unit of measurement	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base Therms/ designated unit of measurement	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B. Impact year usage:	Impact Yr kW	N/E	N/E	N/E	N/E	N/E	N/E	N/E	N/E	N/E	N/E
	Impact Yr kWh	N/E	N/E	N/E	N/E	N/E	N/E	N/E	N/E	N/E	N/E
	Impact Yr Therms	103	92	90	117	79	104	93	114	82	102
	Impact Yr kW/designated unit	N/E	N/E	N/E	N/E	N/E	N/E	N/E	N/E	N/E	N/E
	Impact Yr kWh/designated unit	N/E	N/E	N/E	N/E	N/E	N/E	N/E	N/E	N/E	N/E
	Impact Yr Therms/designated unit	103	92	90	117	79	104	93	114	82	102
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	N/A	N/E	N/A	N/A	N/E	N/E	N/A	N/A	N/E	N/E
	A. ii. Load Impacts - kWh	N/A	N/E	N/A	N/A	N/E	N/E	N/A	N/A	N/E	N/E
	A. iii. Load Impacts - Therms	N/A	-11	N/A	N/A	-30	7	N/A	N/A	-26	3
	B. i. Load Impacts/designated unit - kW	N/A	N/E	N/A	N/A	N/E	N/E	N/A	N/A	N/E	N/E
	B. ii. Load Impacts/designated unit - kWh	N/A	N/E	N/A	N/A	N/E	N/E	N/A	N/A	N/E	N/E
	B. iii. Load Impacts/designated unit - Therms	N/A	-11	N/A	N/A	-30	7	N/A	N/A	-26	3
	C. i. a. % change in usage - Part Grp - kW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C. i. b. % change in usage - Part Grp - kWh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C. i. c. % change in usage - Part Grp - Therms	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C. ii. a. % change in usage - Comp Grp - kW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C. ii. b. % change in usage - Comp Grp - kWh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C. ii. c. % change in usage - Comp Grp - Therms	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D. Realization Rate:	D.A. i. Load Impacts - kW, realization rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	D.A. ii. Load Impacts - kWh, realization rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	D.A. iii. Load Impacts - Therms, realization rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	D.B. i. Load Impacts/designated unit - kW, real rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	D.B. ii. Load Impacts/designated unit - kWh, real rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	D.B. iii. Load Impacts/designated unit - Therms, real rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3. Net-to-Gross Ratios		**RATIO**		**RATIO**	**RATIO**			**RATIO**	**RATIO**		
	A. i. Average Load Impacts - kW	99%		99%	99%			99%	99%		
	A. ii. Average Load Impacts - kWh	99%		99%	99%			99%	99%		
	A. iii. Average Load Impacts - Therms	99%		99%	99%			99%	99%		
	B. i. Avg Load Impacts/designated unit of measurement - kW	99%		99%	99%			99%	99%		
	B. ii. Avg Load Impacts/designated unit of measurement - kWh	99%		99%	99%			99%	99%		
	B. iii. Avg Load Impacts/designated unit of measurement - Therms	99%		99%	99%			99%	99%		
	C. i. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - kW	N/A		N/A	N/A			N/A	N/A		
	C. ii. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - kWh	N/A		N/A	N/A			N/A	N/A		
	C. iii. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - Thms	N/A		N/A	N/A			N/A	N/A		
4. Designated Unit Intermediate Data		**PART GRP**	**COMP GRP**	**PART GRP**	**PART GRP**	**COMP GRP**	**COMP GRP**	**PART GRP**	**PART GRP**	**COMP GRP**	**COMP GRP**
	A. Pre-install average value	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	B. Post-install average value	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6. Measure Count Data		**NUMBER**	**INC COST**								
	A. Number of measures installed by participants in Part Group (WATER HEATING ONLY)	Electric Gas 28									
	B. Number of measures installed by all program participants in the 12 months of the program year (CUSTOM BUDGET COUNTS - GAS ONLY)	1582	$74.45 per gas budget								
	C. Number of measures installed by Comp Group (WATER HEATING ONLY)	Electric 1 Gas 24									
7. Market Segment Data		**CZone 7**	**CZone 10**								
	Number of Participants -Gas (BUDGET COUNT)	927	655								

NOTE: Net-to-gross ratio determined from building simulations and defined as 1 minus the percentage nonparticipants exceed Title 24 Compliance requirements

NOTE: N/E means no estimate; due to small sample sizes (8 participants, 10 non-participants), the results would be misleading

NOTE: There is no *ex ante* estimate for this DUOM, therefore, there is no realizarion rate

SAN DIEGO GAS & ELECTRIC

M&E PROTOCOLS TABLE 6 - RESULTS USED TO SUPPORT PY94 SECOND EARNINGS CLAIM FOR RESIDENTIAL NEW CONSTRUCTION PROGRAM

FIRST YEAR LOAD IMPACT EVALUATION, FEBRUARY 1996, STUDY ID NO. 932

Designated Unit of Measurement LOAD IMPACTS PER PERSON

END USE: WATER HEATING

				5. A. 90% CONFIDENCE LEVEL				5. B. 90% CONFIDENCE LEVEL			
				LOWER BOUND	UPPER BOUND	LOWER BOUND	UPPER BOUND	LOWER BOUND	UPPER BOUND	LOWER BOUND	UPPER BOUND
1. Average Participant Group and Average Comaprison Group		**PART GRP**	**COMP GRP**	**PART GRP**	**PART GRP**	**COMP GRP**	**COMP GRP**	**PART GRP**	**PART GRP**	**COMP GRP**	**COMP GRP**
A. Pre-install usage:	Pre-install kW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Pre-install kWh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Pre-install Therms	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base kW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base kWh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base Therms	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base kW/ designated unit of measurement	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base kWh/ designated unit of measurement	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Base Therms/ designated unit of measurement	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B. Impact year usage:	Impact Yr kW	N/E	N/E	N/E	N/E	N/E	N/E	N/E	N/E	N/E	N/E
	Impact Yr kWh	N/E	N/E	N/E	N/E	N/E	N/E	N/E	N/E	N/E	N/E
	Impact Yr Therms	103	92	90	117	79	104	93	114	82	102
	Impact Yr kW/designated unit	N/E	N/E	N/E	N/E	N/E	N/E	N/E	N/E	N/E	N/E
	Impact Yr kWh/designated unit	N/E	N/E	N/E	N/E	N/E	N/E	N/E	N/E	N/E	N/E
	Impact Yr Therms/designated unit	33.0	29.2	37.2	28.7	33.2	25.2	36.3	29.6	32.3	26.1
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	N/A	N/E	N/A	N/A	N/E	N/E	N/A	N/A	N/E	N/E
	A. ii. Load Impacts - kWh	N/A	N/E	N/A	N/A	N/E	N/E	N/A	N/A	N/E	N/E
	A. iii. Load Impacts - Therms	N/A	-11	N/A	N/A	-30	7	N/A	N/A	-26	3
	B. i. Load Impacts/designated unit - kW	N/A	N/E	N/A	N/A	N/E	N/E	N/A	N/A	N/E	N/E
	B. ii. Load Impacts/designated unit - kWh	N/A	N/E	N/A	N/A	N/E	N/E	N/A	N/A	N/E	N/E
	B. iii. Load Impacts/designated unit - Therms	N/A	-3.7	N/A	N/A	-9.8	2.1	N/A	N/A	-8.3	0.8
	C. i. a. % change in usage - Part Grp - kW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C. i. b. % change in usage - Part Grp - kWh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C. i. c. % change in usage - Part Grp - Therms	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C. ii. a. % change in usage - Comp Grp - kW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C. ii. b. % change in usage - Comp Grp - kWh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C. ii. c. % change in usage - Comp Grp - Therms	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D. Realization Rate:	D.A. i. Load Impacts - kW, realization rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	D.A. ii. Load Impacts - kWh, realization rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	D.A. iii. Load Impacts - Therms, realization rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	D.B. i. Load Impacts/designated unit - kW, real rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	D.B. ii. Load Impacts/designated unit - kWh, real rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	D.B. iii. Load Impacts/designated unit - Therms, real rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3. Net-to-Gross Ratios		**RATIO**		**RATIO**	**RATIO**			**RATIO**	**RATIO**		
	A. i. Average Load Impacts - kW	99%		99%	99%			99%	99%		
	A. ii. Average Load Impacts - kWh	99%		99%	99%			99%	99%		
	A. iii. Average Load Impacts - Therms	99%		99%	99%			99%	99%		
	B. i. Avg Load Impacts/designated unit of measurement - kW	99%		99%	99%			99%	99%		
	B. ii. Avg Load Impacts/designated unit of measurement - kWh	99%		99%	99%			99%	99%		
	B. iii. Avg Load Impacts/designated unit of measurement - Therms	99%		99%	99%			99%	99%		
	C. i. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - kW	N/A		N/A	N/A			N/A	N/A		
	C. ii. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - kWh	N/A		N/A	N/A			N/A	N/A		
	C. iii. Avg Load Impacts based on % chg in usage in Impact year relative to Base usage in Impact year - Thms	N/A		N/A	N/A			N/A	N/A		
4. Designated Unit Intermediate Data		**PART GRP**	**COMP GRP**	**PART GRP**	**PART GRP**	**COMP GRP**	**COMP GRP**	**PART GRP**	**PART GRP**	**COMP GRP**	**COMP GRP**
	A. Pre-install average value	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	B. Post-install average value (PER PERSON)	3.13	3.14	1.58	4.68	1.76	4.53	1.92	4.34	2.06	4.22
6. Measure Count Data		**NUMBER**	**INC COST**								
	A. Number of measures installed by participants in Part Group (WATER HEATING ONLY)	Electric 28 Gas									
	B. Number of measures installed by all program participants in the 12 months of the program year (CUSTOM BUDGET COUNTS - GAS ONLY)	1582	$74.45 per gas budget								
	C. Number of measures installed by Comp Group (WATER HEATING ONLY)	Electric 1 Gas 24									
7. Market Segment Data		**CZone 7**	**CZone 10**								
	Number of Participants -Gas (BUDGET COUNT)	927	655								

NOTE: Net-to-gross ratio determined from building simulations and defined as 1 minus the percentage nonparticipants exceed Title 24 Compliance requirements

NOTE: N/E means no estimate, due to small sample sizes (8 participants, 10 non-participants), the results would be misleading

NOTE: The standard error associated with the confidence intervals for the designated unit of measurement is calculated from the standard error of the ratios of load impacts/number of people in household

NOTE: There is no *ex ante* estimate for this DUOM, therefore, there is no realizarion rate

M&E PROTOCOLS TABLE 7

DATA QUALITY AND PROCESSING DOCUMENTATION

FOR

RESIDENTIAL NEW CONSTRUCTION PROGRAM
FIRST YEAR LOAD IMPACT EVALUATION

FEBRUARY 1996

STUDY ID NO. 932

M&E PROTOCOLS TABLE 7
DATA QUALITY AND PROCESSING DOCUMENTATION
For Residential New Construction Program
First Year Load Impact Evaluation
February 1996
Study ID No. 932

A. OVERVIEW INFORMATION

1. **Study Title and Study ID:** 1994 Residential New Construction Program: First Year Load Impact Evaluation, February 1996, MIAP-94-P05-932-603, Study ID No. 932

2. **Program, Program Year(s), and Program Description (design):** Residential New Construction Program for the 1994 program year. The Program is intended to encourage new home builders to incorporate energy saving advanced building technologies and to install energy efficient measures and appliances, both of which exceed Title 24 State Building Energy Efficiency Standards by a minimum of five percent.

3. **End Uses and/or Measures Covered:** Space cooling, space heating, and water heating.

4. **Methods and models used:** See the section of the report entitled "The Econometric Framework" on page 3 for a complete description of the final model specifications.

5. **Participant and comparison group definition:** *For the load impact analysis:* the participants in the 1994 Residential New Construction Program are defined as having signed an agreement after July 1993, and completed construction in calendar year 1994. The comparison group sample was developed from SDG&E's Customer Master File with a "meter set date" (date the meter was originally placed in service) and "meter turn on date" (the date service began to the current customer) both with a date in calendar year 1994. *For the building simulations:* building simulations representing 1,119 participant lots were analyzed. This group passed the simple criteria of signing contracts and completing the projects in 1994. (Those contracts signed prior to 1994 and/or not completed by the end of 1994 were excluded for comparison purposes.) A sample of 46 nonparticipants had building simulations run after completion of on-site audits. This sample was randomly selected from the 272 nonparticipants in the database described in the Nonparticipant Sample - Load Impact Analysis section as representative of residential new construction customers who did not the participate in SDG&E's 1994 Residential New Construction Program. This group was defined as having a home built and completed in 1994.

6. Analysis sample size:

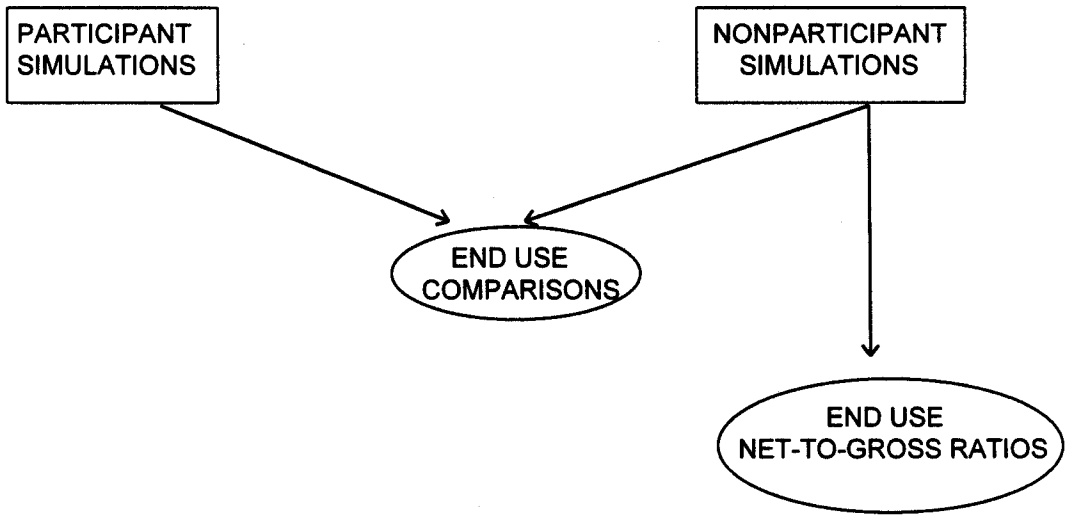
PARTICIPANT SAMPLE FOR 1994 RESIDENTIAL NEW CONSTRUCTION (SFDU)				
End Use	# of Customers	# of Installations	# of Measures	Avg. # of Months of Data
Space Heat-ELE	36	36	1608	16.4
Space Heat-GAS	248	248	1582	15.5
Space Cooling	168	168	168	15.8
Water Heat-ELE	8	8	N/A	N/A
Water Heat-GAS	280	280	1582	15.4

NONPARTICIPANT SAMPLE FOR 1994 RESIDENTIAL NEW CONSTRUCTION (SFDU)				
End Use	# of Customers	# of Installations	# of Measures	Avg. # of Months of Data
Space Heat-ELE	15	15	N/A	16.8
Space Heat-GAS	186	186	N/A	16.4
Space Cooling	164	164	164	16.3
Water Heat-ELE	10	10	N/A	N/A
Water Heat-GAS	249	249	N/A	16.3

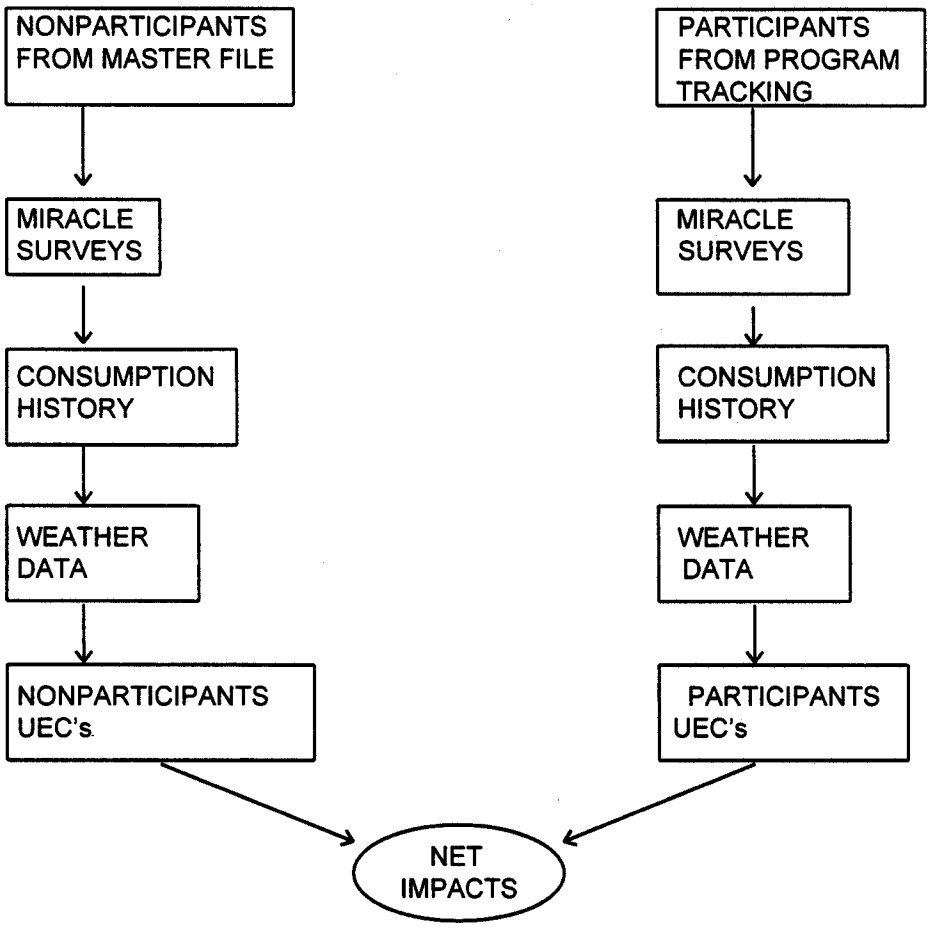
B. DATABASE MANAGEMENT

1. Flow Charts:

DATA FLOW DIAGRAM
BUILDING SIMULATIONS



DATA FLOW DIAGRAM
LOAD IMPACTS



2. **Data sources:** the data came from the following sources:

- Building simulations for samples of program participants and nonparticipants;
- Customer name, address, and participation date from the program tracking database;
- MIRACLE surveys for samples of program participants and nonparticipants;
- Electric and gas consumption history from the Customer Master File, as well as the source for the nonparticipant comparison group; and Hourly weather data for two climate zones from NOAA files.

The building simulations were the basis for the net-to-gross ratios. The other data were merged together to form the dataset for the regression analysis leading to the estimated energy savings for space cooling, space heating, and hot water heaters.

3. Data Attrition:

a. Participant Sample - Load Impact Analysis

For the load impact analysis, the 1,732 participants in the 1994 Residential New Construction Program are defined as having signed an agreement after July 1993, and completed construction in calendar year 1994. After eliminating participants with missing or duplicate account numbers and merging with the Customer Master File, there were 1,310 participants for analysis. Further screening to eliminate files with missing names, names of building developers (i.e., unoccupied sites), and having the last month of consumption of at least 10 kWh (another occupancy check), left a list of 923 participants. These 923 participants were asked to fill out SDG&E's residential energy use survey, known as the MIRACLE survey (Marketing Information Research and Customer Load Estimate). The MIRACLE survey provides detailed information about household characteristics, appliance saturation levels, conservation measures adopted, and energy use practices.

Of the 923 participants who received a MIRACLE survey, 450 completed it. One question on the survey asks the year the house was built; 427 responded that their home was built in 1994. In order to analyze these customers in accordance with the M&E Protocols, nine months of consumption after the DSM installation is required, further lowering the analytical sample to 360 participants. Finally, the M&E Protocols for residential new construction concerns only single family dwelling units, leaving a participant database of 309 for analysis purposes.

Number of Participants for Load Impact Analysis	
Signed contract after 7/93 & completed in '94	1,732
Merge w/master file, eliminate duplicate or missing account numbers	1,310
Screen for missing names, developers, & occupancy: sent MIRACLES	923
MIRACLE responses	450
MIRACLE answer that home was built in '94	427
Had nine months of post consumption data	360
MIRACLE answer that home was single family dwelling unit (SFDU)	309

b. Nonparticipant Sample - Load Impact Analysis

The M&E Protocols require a nonparticipant sample of the Residential New Construction Program as a comparison group. The comparison group sample was developed from SDG&E's Customer Master File with a "meter set date" (date the meter was originally placed in service) and "meter turn on date" (the date service was established in the current customer's name) both of which were in calendar year 1994.

From this filtered group, a random sample of 1,300 was selected. After eliminating participants and names of building developers (i.e., vacant sites) from the sample, the remaining 1,187 nonparticipants were asked to fill out the MIRACLE survey, of which 516 responded. Screening on the responses lowered our nonparticipant sample for comparative analysis as follows: 421 responded that their home was built in 1994; the 421 was lowered to 363 in order to satisfy the nine months of consumption data requirement, and out of this subset, 272 responded that their home is a single family dwelling unit, thus creating the nonparticipant database for analysis purposes.

Number of Nonparticipants for Load Impact Analysis	
Random sample of Master file with set date and turn on date in 1994	1,300
Eliminate participants & developers(occupancy check): sent MIRACLES	1,187
MIRACLE responses	516
MIRACLE answer that home was built in '94	421
Had nine months of post consumption data	361
MIRACLE answer that home was single family dwelling unit (SFDU)	272

Building simulations representing 1,119 participant lots were analyzed. This group passed the simple criteria of signing contracts and completing the projects in 1994 (contracts signed prior to 1994 and/or not completed by the end of 1994 were excluded for comparison purposes.) A sample of 46 nonparticipants had building simulations run after completion of on-site audits. This sample was randomly selected from the 272 nonparticipants in the database described in the Nonparticipant Sample - Load Impact Analysis section as representative of residential new construction customers who did not the participate in SDG&E's 1994 Residential New Construction Program. This group was defined as having a home built and completed in 1994.

4. **Data Quality Checks:** The data sets for the regression analysis were merged in SAS by the appropriate key variables. Counts of the data sets before and after the merges were verified to ensure accurate merging.

5. **All data collected** for this analysis was utilized.

C. SAMPLING

1. **Sampling procedures and protocols:** A census of participants was attempted to fill out the MIRACLE surveys. Please see the section of the report entitled Participant Sample - Load Impact Analysis on page 2 for a detailed description. The section of the report entitled Nonparticipant Sample - Load Impact Analysis on page 3 describes the sampling process for the nonparticipants in an attempt to get 450 nonparticipants as prescribed in the Protocols.

2. **Survey information:** A copy of the MIRACLE survey is attached at the end of the report. Response rates for the participants was 450 out of 923, or 49%. 516 nonparticipants responded out of a random sample of 1,187 who received the MIRACLE survey, or 43%. This was a mail survey; no reasons for refusal are available, nor was there any effort to account for non-response bias.

3. **Statistical Descriptions:** the descriptive statistic is annual consumption:

	Avg Annual kWh	Avg Annual Therms
Participants	5,157	336
Nonparticipants	5,423	333

D. DATA SCREENING AND ANALYSIS

1. There were no outliers in the data. Missing data points were ignored in all calculations. Weather adjustments are described in the Econometric Framework section of the report on page 3.

2. No adjustments were made to control for the effect of "background" variables.

3. See the sections of the report entitled Participant Sample - Load Impact Analysis on page 2 and Nonparticipant Sample - Load Impact Analysis on page 3 for screening data for inclusion in the final analysis dataset.

4. **Regression statistics:**

Regression Statistics for the Participants		
End Use	**Mean of the UEC's**	**Standard Error**
Space Heat-ELE	1,107	145.73
Space Heat-GAS	241	3.00
Space Cooling	1,170	37.77
Water Heat-GAS	103	8.13
Regression Statistics for the Nonparticipants		
End Use	**Mean of the UEC's**	**Standard Error**
Space Heat-ELE	1,207	146.19
Space Heat-GAS	247	3.18
Space Cooling	1,357	38.26
Water Heat-GAS	92	7.67

5. **Specification:**

a. The electricity model is estimated entirely at the customer level (the extreme case of accounting for customer heterogeneity); the sole source of variation is variation in weather over time. Phase 1 of the gas model has the same property. Phase 2 of the gas model uses only cross sectional variation.

b. The cooling degreehour and heating degreehour regressors are quite straightforward. They are based on estimates of hourly temperature (which are, in turn, based on daily high and low temperatures). The base for the cooling degreehour and heating degreehour are 65 degrees Fahrenheit. No other time dependent regressors were included.

c. There is no explicit treatment for self-selection. The study follows the straightforward framework found in the measurement protocols, and adopts the assumption of the protocols that the nonparticipant group is an estimate for the actions of the participant group in the absence of the program.

d. NA

e. See the Results section of the report on page 5.

6. **Error in measuring variables:** A series of reasonability checks were run on survey data to verify fuel types and account for missing answers to the MIRACLE survey. Billing data were screened for changes in occupancy.

7. **Autocorrelation:** Not Addressed.

8. **Heteroskedasticity:** Not Addressed.

9. **Collinearity:** Not Addressed.

10. **Influential data points:** Not Addressed.

11. **Missing Data:** Missing data points were ignored in all calculations.

12. **Precision:** The standard errors for the estimates were calculated from the variances of the samples of participants and nonparticipants on the variable(s) in question, unless noted on Table 6.

E. DATA INTERPRETATION AND APPLICATION

1. **Calculation of net impacts:** This study calculates the net load impacts for space heating, space cooling, and water heating by subtracting the UEC's of program participants from the UEC's of the comparison group. The methodology of this study estimates the net effects directly without estimating the gross impacts. Therefore, the traditional net-to-gross (NTG) ratio definition is not applicable to this analysis. In order to estimate the NTG ratios for this study,

building simulations are utilized. In this analysis, the NTG ratio is defined as 1 minus the nonparticipants' compliance over Title 24 State Building Energy Efficiency Standards.

2. This methodology is an option in the Protocols Table C-7, Participant Group item 3, option (a), and utilizes SDG&E's in-house expertise. In this analysis, the NTG ratio is defined as 1 minus the nonparticipants' compliance over Title 24 State Building Energy Efficiency Standards, since the purpose of the Program is to get builders to install measures that exceed Title 24 Standards.