

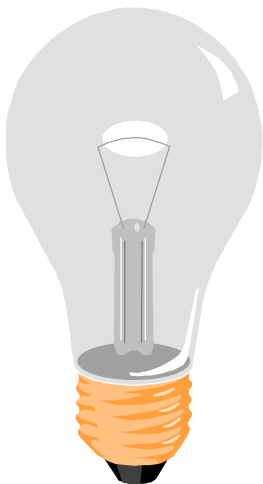


**San Diego Gas & Electric
Marketing Programs & Planning
8306 Century Park Court
San Diego, California 92123**

***1994 & 1995 Residential Appliance Efficiency
Incentives Program: Compact Fluorescent Lights***

Fourth Year Retention Evaluation

March 1999



Study ID No. 921

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**1994 & 1995 RESIDENTIAL APPLIANCE EFFICIENCY INCENTIVES
PROGRAM: COMPACT FLUORESCENT LIGHTS
FOURTH YEAR RETENTION EVALUATION
STUDY ID NO. 921**

Program Description

SDG&E's PY94 and PY95 Compact Fluorescent Lights (CFLs) utilized the development of improved fluorescent lighting as an alternative to standard incandescent lighting. CFLs provide a method of direct replacement to incandescent bulbs with the benefits of lower watt usage and longer lamp life.

The Compact Fluorescent Lighting Program was designed to educate and increase consumer awareness of this energy efficient technology and to encourage the installation of CFLs. The program was designed to help stimulate enough demand to make it more economical for retailers to stock and sell these devices.

The program's product line was comprised of modular, high power factor/low harmonic distortion lamps, which provides a high quality product. During 1995, the product line was expanded to include dedicated hard-wire compact fluorescent fixtures.

Several channels of distribution were used in disseminating lamps to customers. The primary channel was retailers, with the secondary channel through SDG&E field operations and other DSM programs. The CFLs were packaged with a postcard (a copy is provided at the end of this study) requesting customer and product information. The card asked for the customer's name, address, phone number, number of bulbs purchased and wattage. The retention sample for this study was drawn from this database.

Sampling and Data Collection

The M&E Protocols require that retention studies evaluate the top 10 measures or 50% of the estimated resource value, whichever number of measures is less. For the Compact

Fluorescent Lighting Program, only bulbs were offered in PY94 and thus makeup 100% of the estimated resource value. In PY95, hard-wire compact fluorescent fixtures were added to the program and comprised 49% of the estimated resource value. The PY94 and PY95 CFL bulb customers combined are the basis for estimating the Effective Useful Life (EUL) for bulbs while the PY95 fixture customers are used to estimating the EUL for fixtures.

Since 1995, CIC Research, Inc. has been retained to conduct “peak day” telephone surveys on the participants who purchased bulbs and fixtures in the program. The “peak day” survey was administered during the week of SDG&E’s electric system peak demand. Customers were asked how many bulbs/fixtures they purchased, how many they still have in place, and whether or not the device was on during the system peak demand (the purpose of this question was to get a factor for load impact analysis). In 1998, the questions regarding whether or not the bulb was on at time of peak was dropped since load impact analyses are no longer required.

For the PY94 CFL bulb customers, 812 were surveyed in 1995. Of these 812 customers, 462 surveys were completed in 1996. In 1997, 147 surveys from the 462 were completed. Since this original sample was being depleted, a new random sample was drawn in 1998 from the original database of PY94 CFL bulb customers. This resulted in 504 completed surveys.

For the PY95 CFL bulb customers, 334 were surveyed in 1996. Of these 334 customers, 188 surveys were completed in 1997. Since this original sample was being depleted, a new random sample was drawn in 1998 from the original database of PY95 CFL bulb customers. This resulted in 510 completed surveys.

For the PY95 CFL fixture customers, 421 were surveyed in 1996. Of these 421 customers, 260 surveys were completed in 1997. Since this original sample was being depleted, a new random sample was drawn in 1998 from the original database of PY95 CFL fixture customers. This resulted in 511 completed surveys.

Survey Year	Number of Completed Surveys (1998 was a new random draw)		
	PY94 Bulbs	PY95 Bulbs	PY95 Fixtures
1995	812	N/A	N/A
1996	462	334	421
1997	147	188	260
1998	504	510	511

Copies of the surveys and response rates are provided at the end of this study and in M&E Protocol Reporting Requirement Table 7.

Measures/"Like" Measures

In order to apply any changes in EUL to measures not studied, M&E Protocols require that the utility identify any "like" measures within the program. For SDG&E's PY94 and PY95 Compact Fluorescent Lighting Program, there are no "like" measures since bulb and fixture customers were surveyed regardless of wattage and distribution channel. The *ex ante* estimated EUL for all bulbs in the program is 7 years for PY94 and 8 years for PY95. The reason for this difference is the underlying assumption in run hours. In PY94, bulbs were assumed to be "on" 3.7 hours per day, which equates to an EUL of 7 years. Further research revised this assumption to 3.3 hours per day for PY95, which translates to an EUL of 8 years. The *ex ante* estimated EUL for hard-wire CFL fixtures in the program is 20 years.

Econometric Framework

Retention model for estimating median lifetime

The model for lifetime estimation involves the key concepts of the survivor function, the hazard function, and median lifetime. Once these concepts are established, they will be applied to the data and a maximum-likelihood framework (which brings the concepts and the data together) to produce estimated median lifetime.

The survivor function

For the lifetime of the equipment in question, the survivor function is,

$$S(j) = \text{prob}(\text{lifetime} \geq j)$$

It is the estimated survivor function that allows the formation of an expected median lifetime. Of course, the survivor function must be specified. This is done through a related function: the hazard function.

The hazard function

The hazard function $h(j)$ is the probability of equipment failure (removal, retirement, etc.) in the next unit of time, conditioned on having reached age j . It bears the following relationship to the survivor function.

$$h(j) = -\frac{dS(j)/dj}{S(j)}$$

The hazard function is generally the "intuitive starting point" of any lifetime analysis, since it is structured to reflect the general pattern of equipment failures. The quadratic hazard function allows for U-shaped and linear hazard curves ($b_2 = 0$, below), as well as an exponential survivor function ($b_1 = b_2 = 0$, below) as special cases:¹

Equation 1 (The quadratic hazard function)

$$-\frac{dS(j)/dj}{S(j)} = h(j) = b_0 + b_1j + b_2j^2$$

Note that the hazard function is actually a differential equation in the survivor curve.

Getting the survivor function from the hazard function

The exact structure of the survivor function can be obtained by solving the hazard function (a differential equation in the survivor function) for $S(j)$, imposing the constraint $S(0)=1$:

Equation 2 (The survivor function)

$$S(j) = e^{-(\beta_1j + \beta_2j^2 + \beta_3j^3)} \quad (\beta_1 = b_0, \quad \beta_2 = \frac{b_1}{2}, \quad \beta_3 = \frac{b_2}{3})$$

The median lifetime

The median age at failure m is then given by the implicit expression,

Equation 3 (Definition of the median m)

$$S(m) = e^{-(\beta_1m + \beta_2m^2 + \beta_3m^3)} = \frac{1}{2}$$

We now show the steps necessary to estimate the median lifetime from actual data, by defining the "discrete failure function" and the likelihood function.

¹ Lawless, J.F. (1982). *Statistical Models and Methods for Lifetime Data*. New York: Wiley. 252-253.

The discrete failure function

For uniform periods of time (months), the likelihood of failure at age j (before age $j+1$) is,

Equation 4 (The discrete failure function)

$$F(j) = S(j) - S(j+1)$$

The data, the likelihood function, and estimation

Consider an equipment sample of size n . Let n_j^F be the number of known failures at age j , and let n^Q be the number of known failures whose age at failure is unknown; then the number of survivors by observation at age J is $n - n^Q - \sum_{j=0}^J n_j^F$. Furthermore, let ω be the likelihood that the

age at failure is unknown, given failure. The log-likelihood function (the log of the likelihood of observing the data) is then,

$$L(\beta, \omega) = \sum_{j=0}^J n_j^F \log[(1-\omega)F(j)] + n^Q \log\{\omega[1-S(J+1)]\} + \left(n - n^Q - \sum_{j=0}^J n_j^F \right) \log S(J+1).$$

The log-likelihood function can be maximized with respect to its arguments just as a sum-of-squares function can be minimized in a standard regression problem. Standard numerical and grid-search methods can be used to maximize the log-likelihood function. Once estimates are obtained for the vector of coefficients β , the median lifetime can be estimated using Equation 3.

The estimated variance of β , on which the standard errors of its elements are based, is a fairly complex calculation and one which will not be expressly derived here, although the calculation is based on the expectation of the second-derivative matrix for the log-likelihood function:

$$\text{VAR}(\beta) = \left(E \frac{\partial^2 L}{\partial \beta \partial \beta'} \right)^{-1}$$

The estimated median is a nonlinear function of β ; as such, its standard error can be estimated dependably for large samples, based on $\text{VAR}(\beta)$.

Solving data problems--developing independent and dependent failures

Lifetime estimation using maximum likelihood requires the statistical independence of failures. Sometimes equipment failures are indeed independent, as when failures occur due to age or manufacturing weaknesses. However, in many cases failures are not independent--that is, they

are "dependent"--as when, for example, a "cluster" or "bank" of lighting measures are jointly removed during a remodeling.

Independent failures can easily be handled using the maximum likelihood framework described above. Fortunately, dependent failures can also be handled in a similar fashion. A cluster of dependent failures can be viewed as an independent failure in its own right, one of numerous observed clusters, each of which is subject to the possibility of independent failure. The maximum likelihood framework can simply be applied to the clustered data.

Modeling and estimating with independent and dependent failures

When any one piece of equipment is subject to both independent and dependent failure, the hazard function can be modified accordingly (ignoring the event of both types of failures occurring jointly):

$$h(j) = h_{\text{ind}}(j) + h_{\text{dep}}(j)$$

Independent failures are bound to be age-dependent, so that,

$$h_{\text{ind}}(j) = b_0^{\text{ind}} + b_1 j + b_2 j^2$$

Dependent failures are mostly likely age-independent (with respect to the building-remodeling effect, we expect the age of the equipment to be irrelevant), so that,

$$h_{\text{dep}}(j) = b_0^{\text{dep}}$$

This yields a new survivor function (and, implicitly, a new median life that can be estimated based on the joint use of independent and dependent failure data):

$$S(j) = e^{-[(\beta_1^{\text{ind}} + \beta_1^{\text{dep}})j + \beta_2 j^2 + \beta_3 j^3]}$$

The variance matrix for the joint estimation problem can be constructed, as can the standard error for the jointly estimated median lifetime, represented by the expression,

$$S(m) = e^{-[(\beta_1^{\text{ind}} + \beta_1^{\text{dep}})j + \beta_2 m^2 + \beta_3 m^3]} = \frac{1}{2}$$

M&E PROTOCOLS TABLE 6

RESULTS USED TO SUPPORT

PY94 THIRD EARNINGS CLAIM

FOR

RESIDENTIAL APPLIANCE EFFICIENCY INCENTIVES

PROGRAM:

COMPACT FLOURESCENT LIGHTS

FOURTH YEAR RETENTION EVALUATION

MARCH 1999

STUDY ID NO. 921

TABLE 6 for RETENTION STUDIES
PROGRAM: RAEI-Compact Fluorescent Lights
YEAR(S): PY94 & PY95

1. Enduse	1. Measure	2. <i>ex-ante</i> EUL	2. <i>ex-ante</i> EUL Source	3. <i>ex-post</i> EUL from Study	4. <i>ex-post</i> EUL for 3rd & 4th claim	5. Standard Error	6. Upper & lower bounds @ 80% Conf Int		7. P Value	8. Realization Rate	9. "Like" Measures to be Adjusted
Lighting	CFL Bulbs	7.5	**	10.2	10.2	0.4	10.0	10.4	0.0%	1.36	All Bulbs
Lighting	CFL Fixtures	20	**	20.4	20	1.5	19.6	21.2	80.3%	1.00	All Fixtures

* In 1994, the assumption was 3.7 hrs/day, which equates to an EUL of 7 years
 Additional research revised the estimate to 3.3 hrs/day, or 8 year EUL for 1995

**Advice Letter filing 926-E-A/934-G-A: March 23, 1995

M&E PROTOCOLS TABLE 7

DATA QUALITY AND PROCESSING

DOCUMENTATION

FOR

RESIDENTIAL APPLIANCE EFFICIENCY INCENTIVES

PROGRAM:

COMPACT FLOURESCENT LIGHTS

FOURTH YEAR RETENTION EVALUATION

MARCH 1999

STUDY ID NO. 921

M&E PROTOCOLS TABLE 7

DATA QUALITY AND PROCESSING DOCUMENTATION

For RAEI-Lighting Program

Fourth Year Retention Evaluation

March 1999

Study ID No. 921

B. RETENTION STUDIES

1. OVERVIEW INFORMATION

- a. **Study Title and Study ID:** 1994 & 1995 Residential Appliance Efficiency Incentives: Lighting – Fourth Year Retention Evaluation, March 1999, Study ID No. 921
- b. **Program, Program Year(s), and Program Description (Design):** RAEI Compact Fluorescent Lighting Program for the 1994 and 1995 program years. The Program was designed to increase consumer awareness and stimulate demand to make it economical for retailers to stock and sell CFL bulbs and fixtures.
- c. **End Uses and Measures Covered:** Lighting, two measures: CFL bulbs and CFL hard-wire fixtures.
- d. **Methods and Models Used:** See the section of the report entitled Econometric Framework for a complete description of the final model specifications.
- e. **Analysis sample size:**

Program Year	Measure	# of Customers in Program	# of Installations in Program	# of Measures Installed in Program	# of Surveys in Sample Frame	Date of Retention Studies
94	CFL Bulbs	Unknown since this is a retail program	296,954	296,954	812	Mar-Jun '95
					462	Aug '96
					147	Oct '97
					504	Sep '98

Program Year	Measure	# of Customers in Program	# of Installations in Program	# of Measures Installed in Program	# of Surveys in Sample Frame	Date of Retention Studies
95	CFL Bulbs	Unknown (retail program)	295,453	295,453	334	Aug '96
					188	Oct '97
					510	Sep '98
95	CFL Fixtures	Unknown (retail program)	72,629	72,629	421	Aug '96
					260	Oct '97
					511	Sep '98

NOTE: In 1998, a new random sample was drawn for all 3 measures.

2. DATABASE MANAGEMENT

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

- Customer name, address, phone number, installed measures, and participation date from the returned postcard database
- CFL bulbs and fixtures were determined to be in place and operable by the phone survey described in the section of the report entitled Sampling and Data Collection.

The data were merged together to form the dataset for the econometric analysis leading to the estimated Effective Useful Life

- b. **Data Attrition:** the goal for 1998 was to achieve a sample of 1,500 completed surveys – 500 each for: 1) PY94 Bulbs, 2) PY95 Bulbs, and 3) PY95 Fixtures (see 1e above). Response tally sheets are provided with the surveys at the end of this report.
- c. **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.
- d. **All data collected** specifically for this analysis was utilized.

3. SAMPLING

- a. **Sampling procedures and protocols:** In 1998, a goal of 500 participants per measure per program year (3 groups of customers) was established. Each of the three groups of customers was provided to CIC Research, Inc. in random order. CIC Research was instructed to start at the top of each list and get the first 500 customers they could to respond. See the section of the report entitled Sampling and Data Collection.

- b. **Survey information:** Copies of the SDG&E Compact Fluorescent Light Bulb/Fixture Surveys over the years are attached to the end of the report. The survey completed response rate was 23% in 1998; see the response tally sheets at the end of the report for reasons for non-completed surveys.
- c. **Statistical Descriptions:** See Failure Distribution Tables provided in Section 4.c

4. DATA SCREENING AND ANALYSIS

- a. **Outliers and Missing Data Points:** No outliers and no missing data.
- b. **Background Variables:** NA
- c. **Screened Data:** In the following failure distribution tables,

NN = the quantity of the measure studied

NQ = the number of observed failures whose age at failure is unknown

NF = the number of observed failures whose age at failure is known

ND = the number of measures still in place and operable

FAILURE DISTRIBUTION TABLES PER MEASURE

DATUM	DESCRIPTOR	AGE (MONTHS)
1361	NN95	NA
120	NQ95	13
2	NQ95	27
1239	ND95	33
rcfl_95_fixtures.xls		

DATUM	DESCRIPTOR	AGE (MONTHS)
1666	NN95	NA
203	NQ95	13
30	NQ95	27
1433	ND95	33
rcfl_95_bulbs.xls		

DATUM	DESCRIPTOR	AGE (MONTHS)
2277	NN94	NA
447	NQ94	15
155	NQ94	25
1675	ND94	45
rcfl_94.xls		

- d. **Model statistics:** See M&E Protocol Table 6.

e. **Specification:**

Study	Type of Data Used		Type of Specification Used		
	Independent Failures	Dependent Failures	Exponential Specification	Linear Specification	Combination Linear/Exponential Specification
RAEI-CFL	x		x		

1) **Heterogeneity:** See section of the report entitled “Econometric Framework.”

2) **Omitted Factors:** None omitted.

f. **Error in Measuring Variables:** NA

g. **Influential Data Points:** None.

h. **Missing Data:** None.

i. **Precision:** The calculation for the standard error is based on the expectation of the second-derivative matrix for the log-likelihood function.

BOUNCE BACK CARD EXAMPLE

FOR

RESIDENTIAL APPLIANCE EFFICIENCY INCENTIVES

PROGRAM:

COMPACT FLOURESCENT LIGHTS

FOURTH YEAR RETENTION EVALUATION

MARCH 1999

STUDY ID NO. 921

BOUNCE BACK CARD EXAMPLE

MEASURE RETENTION SURVEYS

FOR

RESIDENTIAL APPLIANCE EFFICIENCY INCENTIVES

PROGRAM:

COMPACT FLOURESCENT LIGHTS

FOURTH YEAR RETENTION EVALUATION

MARCH 1999

STUDY ID NO. 921

**SAN DIEGO GAS & ELECTRIC COMPANY
RESIDENTIAL LIGHTING (COMPACT FLUORESCENT)
PEAK-HOUR STUDY
SEPTEMBER 1995**

INTERVIEWER _____	TIME BEGAN _____
DATE _____	TIME ENDED _____
SURVEY # _____	ELAPSED TIME _____

Hello, I'm _____ from CIC Research. I'm conducting a survey for San Diego Gas & Electric Company. We would like to ask you four quick questions dealing with the compact fluorescent lights that were purchased by your household in 1994.

A. Is this the _____ residence? A. _____(use customer name)

(1) YES

(2) NO==> (TERMINATE)

(TERMINATION MESSAGE: "Thank you, I'm sorry for any inconvenience.")

Which member of the family over the age of 18 is most familiar with how these lights are used?
(ASK TO SPEAK TO THIS PERSON)

OF LIGHTS

1. How many compact fluorescent lights did you purchase in 1994? 1. _____
(0) NONE or (99) DON'T KNOW (TERMINATED)
2. How many of these lights are currently installed? 2. _____
(0) NONE or (99) DON'T KNOW (TERMINATED)
3. How many of the compact lights that you purchased in 1994 were
TURNED ON at 3:30 TODAY? 3. _____
(0) NONE or (99) DON'T KNOW (TERMINATED)
4. Approximately how many hours each day are these lights turned on? 4. _____

(PROMPT: " Now just to be sure, this is the number of compact florescent lights that were purchased in 1994 that were TURNED ON TODAY at 3:30 ?")

CHANGE QUESTION #3 RESPONSE, IF NECESSARY

SAN DIEGO GAS & ELECTRIC COMPANY
RESIDENTIAL LIGHTING (COMPACT FLUORESCENT)
PEAK-HOUR STUDY - #426
AUGUST 1996

E or O

Hello, I'm _____ from CIC Research. I'm conducting a survey for San Diego Gas & Electric Company. Last October we contacted you regarding the compact fluorescent lights purchased by your household in 1994. We would like to ask you some additional quick questions regarding these lights that were purchased in 1994.

- A. Is this the _____ residence?
 Yes (CONTINUE) No (THANK & TERMINATE)

(TERMINATION MESSAGE: “Thank you, I’m sorry for the inconvenience.”)

Which member of the family over the age of 18 is most familiar with how these lights are used?
(ASK TO SPEAK TO THIS PERSON & REPEAT INTRO)

1. How many compact fluorescent lights did SDG&E give you in 1994? _____ 1. _____
0 None (TERMINATE) -1 Don't Know (TERMINATE)
2. How many of these lights are currently installed? _____ 2. _____
0 None (SKIP TO Q5) -1 Don't Know (SKIP TO Q5)
3. How many of the compact lights that SDG&E gave you in 1994 were TURNED ON at 3 p.m. TODAY (Wednesday)? _____ 3. _____
0 None -1 Don't Know
4. Approximately how many hours each day are these lights turned on? 4. _____

(PROMPT: “Now just to be sure, the number of compact fluorescent lights that SDG&E gave you in 1994 that were TURNED ON TODAY (Wednesday) at 3 p.m. was _____. Is that correct? (CHANGE QUESTION #3 RESPONSE, IF NECESSARY)

5. Do you own or rent your residence?
1 Own / Buying
2 Rent / Lease
9 Refused 5. _____
6. How many people usually live in this household? _____ 6. _____
-1 DK/Refused

7. How many of those are in each of the following age groups?
- | | |
|----------------------------|-----------|
| _____ 18 years and younger | 7. _____ |
| _____ 19 years - 34 years | 8. _____ |
| _____ 35 years - 54 years | 9. _____ |
| _____ 55 years or older | 10. _____ |
8. What is the highest grade of schooling that you have completed?
(READ CHOICES IF NECESSARY)
- 1 Elementary or grammar school
 - 2 Some high school
 - 3 High School graduate
 - 4 Trade or technical school
 - 5 Some college
 - 6 Two-year college graduate
 - 7 Four-year college graduate
 - 8 Some graduate school
 - 9 Graduate degree
 - 99 (Refused)
11. _____
9. Into which of the following groups did your 1995 income fall?
- 1 \$7,499 or less
 - 2 \$7,500 to \$14,999
 - 3 \$15,000 to \$29,999
 - 4 \$30,000 to \$49,999
 - 5 \$50,000 to \$124,999
 - 6 \$125,000 and above
 - 9 DK/REF.
12. _____

Thank you very much for your time and cooperation.

Sex: 1 male 2 female

13. _____

**SDG&E CFL RETENTION STUDY
TALLY OF CALL RESULTS
PY94 BULBS - AUGUST 1996 SURVEY**

<i>Call Result</i>	<i>Number</i>	<i>Percent</i>
No number	6	0.7
3 calls made	92	11.3
# not in service	43	5.3
Business/fax/pay phone /pager	15	1.8
Wrong number/wrong household	27	3.3
Language/communication problem	10	1.2
Callback	1	0.1
Refusal	66	8.1
No answer	1	0.1
Answering machine	1	0.1
Not available till after survey	16	2.0
Terminated at question #1	69	8.4
Out of area	3	0.4
Duplicate	5	0.6
Completed interview	<u>462</u>	<u>56.5</u>
TOTAL	817	100.0%

**SAN DIEGO GAS & ELECTRIC COMPANY
RESIDENTIAL LIGHTING (COMPACT FLUORESCENT)
PEAK-HOUR STUDY - #457
OCTOBER 1997**

Hello, This is _____ from CIC Research. I'm conducting a survey for San Diego Gas & Electric Company.

- A. Is this the _____ residence?
 Yes (CONTINUE) No (THANK & TERMINATE; CODE "WRONG #)

(TERMINATION MESSAGE: "Thank you, I'm sorry for the inconvenience.")

Last October we contacted you regarding the compact fluorescent lights purchased by your household in **1994**. We would like to ask you some additional quick questions regarding these lights that were purchased in **1994**. Which member of the family over the age of 18 is most familiar with how these lights are used? **(ASK TO SPEAK TO THIS PERSON & REPEAT INTRO)**

1. How many compact fluorescent lights did you purchase in 1994? # _____ 1. _____
0 None (TERMINATE; CODE TQ1) -1 Don't Know (TERMINATE; CODE TQ1)
2. How many of these lights are currently installed? # _____ 2. _____
0 None (SKIP TO Q5) -1 Don't Know (SKIP TO Q5)
3. How many of the compact lights that you purchased in 1994 were TURNED ON at 3 p.m. TODAY (Wednesday)? # _____ 3. _____
0 None -1 Don't Know
4. Approximately how many hours each day is each of these lights turned on?
#1 _____ #2 _____ #3 _____ #4 _____ #5 _____ 4. _____

(PROMPT: "Now just to be sure, the number of compact fluorescent lights that you purchased in 1994 that were TURNED ON TODAY (Wednesday) at 3 p.m. was _____. Is that correct? (CHANGE QUESTION #3 RESPONSE, IF NECESSARY)

Now just a few last questions to help us group your answers with those of others. First . . .

5. Do you own or rent your residence? 1 Own / Buying
2 Rent / Lease 5. _____
9 Refused
6. How many people usually live in this household? _____ -1 DK/Ref 6. _____

7. How many of those are in each of the following age groups?
- | | |
|----------------------------|-----------|
| _____ 18 years and younger | 7. _____ |
| _____ 19 years - 34 years | 8. _____ |
| _____ 35 years - 54 years | 9. _____ |
| _____ 55 years or older | 10. _____ |
| <u>-1</u> DK/REF | |

9. What is the highest grade of schooling that you have completed?
(READ CHOICES IF NECESSARY)

- | | |
|---------------------------------------|-----------|
| <u>1</u> Elementary or grammar school | |
| <u>2</u> Some high school | |
| <u>3</u> High School graduate | |
| <u>4</u> Trade or technical school | |
| <u>5</u> Some college | |
| <u>6</u> Two-year college graduate | |
| <u>7</u> Four-year college graduate | |
| <u>8</u> Some graduate school | |
| <u>9</u> Graduate degree | 11. _____ |
| <u>99</u> (DK/REF – DO NOT READ) | |

9. Into which of the following groups did your 1995 income fall?

- | | |
|---------------------------------|-----------|
| <u>1</u> \$7,499 or less | |
| <u>2</u> \$7,500 to \$14,999 | |
| <u>3</u> \$15,000 to \$29,999 | |
| <u>4</u> \$30,000 to \$49,999 | |
| <u>5</u> \$50,000 to \$124,999 | 12. _____ |
| <u>6</u> \$125,000 and above | |
| <u>9</u> (DK/REF – DO NOT READ) | |

Thank you very much for your time and cooperation.

- Sex: 1 male 2 female 13. _____

**SDG&E CFL RETENTION STUDY
TALLY OF CALL RESULTS
PY94 BULBS - OCTOBER 1997 SURVEY**

<i>Call result</i>	<i>Number</i>	<i>Percent</i>
# not called	2	0.6
No number	65	18.0
3 calls made	25	6.9
# not in service	6	1.7
Business/fax/pay phone /pager	3	0.8
Wrong number/wrong household	12	3.3
Language/communication problem	2	0.6
Callback	1	0.3
Refusal	23	6.4
Answering machine	1	0.3
Not available till after survey	1	0.3
Terminated at question #1	73	20.2
Duplicate	1	0.3
Completed interview	<u>147</u>	<u>40.6</u>
TOTAL	362	100%

SDG&E
CFL RETENTION SURVEY - #457
1994 CFL BULBS
SEPTEMBER 1998

Hello, This is _____ from CIC Research. I'm conducting a survey for San Diego Gas & Electric Company. Is this the _____ residence? We would like to ask you some quick questions regarding the **COMPACT FLUORESCENT BULBS** that were **purchased** by your household in 1995. Are you familiar with how these light bulbs are used? **(IF NO, ASK TO SPEAK TO THE PERSON WHO IS MOST FAMILIAR & REPEAT INTRO; ARRANGE CB IF NECESSARY. IF RESPONDENT HAS NO KNOWLEDGE OF CFLs PURCHASED, PROCEED WITH INTERVIEW AND ENTER 0 FOR Q1)**

1. How many compact fluorescent BULBS did you purchase in 1994? # _____

0 None (**THANK & TERMINATE; DO NOT COUNT TOWARD QUOTA**)

-1 Don't Know (**THANK & TERMINATE; DO NOT COUNT TOWARD QUOTA**)

(IF MORE THAN 10 BULBS, ASK:) What led you to purchase _____ bulbs?

2. How many of these BULBS are currently installed? # _____
(# MUST BE LESS THAN OR EQUAL TO Q1#)

0 None

-1 Don't Know

Those are all my questions. Thank you very much for your time and cooperation.

**SDG&E CFL RETENTION STUDY
TALLY OF CALL RESULTS
PY94 BULBS – SEPTEMBER 1998 SURVEY**

<i>Call result</i>	<i>Number</i>	<i>Percent</i>
Number not in service	351	12.8
Wrong number	169	6.1
No answer	576	21.0
Answering machine	589	21.4
Callback	94	3.4
Busy number	10	0.4
Other language (not Spanish)	21	0.8
Refusal	157	5.7
Respondent never available	4	0.1
No knowledge of bulb use	80	2.9
No recall of buying/receiving bulbs	194	7.1
Completed interviews	<u>504</u>	<u>18.3</u>
TOTAL	2,749	100.0%

**SAN DIEGO GAS & ELECTRIC COMPANY
RESIDENTIAL LIGHTING (COMPACT FLUORESCENT)
PEAK-HOUR STUDY - #426
AUGUST 1996**

Hello, I'm _____ from CIC Research. I'm conducting a survey for San Diego Gas & Electric Company. We would like to ask you some quick questions regarding the compact fluorescent lights that were purchased by your business in 1995.

A. Is this the household ?

Yes (CONTINUE) 2 no (THANK & TERMINATE)

(TERMINATION MESSAGE: "Thank you, I'm sorry for the inconvenience.")

Which person in your household is most familiar with how these lights are used? (ASK TO SPEAK TO THIS PERSON & REPEAT INTRO IF NECESSARY)

1. How many compact fluorescent lights did you purchase in 1995? # _____ 1. _____
 0 None (TERMINATE) -1 Don't Know (TERMINATE)
2. How many of these lights are currently installed? # _____ 2. _____
 0 None (SKIP TO Q5) -1 Don't Know (SKIP TO Q5)
3. How many of the compact lights that you purchased in 1995 were TURNED ON
at 3 p.m. TODAY (Wednesday)? # _____ 3. _____
 0 None -1 Don't Know
4. Approximately how many hours each day are these lights turned on? 4. _____
5. What type of business are these lights used in? _____ 5. _____

(PROMPT: "Now just to be sure, the number of compact fluorescent lights that were purchased in 1995 that were TURNED ON TODAY (Wednesday) at 3 p.m. was _____? Is that correct?" CHANGE QUESTION #3 RESPONSE, IF NECESSARY)

Thank you very much for your time and cooperation.

**SDG&E CFL RETENTION STUDY
TALLY OF CALL RESULTS
PY95 BULBS - AUGUST 1996 SURVEY**

<i>Call result</i>	<i>Number</i>	<i>Percent</i>
3 calls made	97	14.2
# not in service	21	3.1
Business/fax/pay phone /pager	27	3.9
Wrong number/wrong household	24	3.5
Language/communication problem	12	1.8
Callback	5	0.7
Refusal	77	11.3
No answer	2	0.3
Answer Machine	7	1.0
Not available till after survey	11	1.6
Busy number	1	0.1
Terminated at question	42	6.1
Out of area	18	2.6
Duplicate	6	0.9
Completed interview	<u>334</u>	<u>48.8</u>
TOTAL	684	100.0%

**SAN DIEGO GAS & ELECTRIC COMPANY
RESIDENTIAL LIGHTING (COMPACT FLUORESCENT)
PEAK-HOUR STUDY - #457
OCTOBER 1997**

Hello, This is _____ from CIC Research. I'm conducting a survey for San Diego Gas & Electric Company.

- A. Is this the _____ residence?
 Yes (CONTINUE) No (THANK & TERMINATE; CODE "WRONG #)

(TERMINATION MESSAGE: "Thank you, I'm sorry for the inconvenience.")

We would like to ask you some quick questions regarding the **COMPACT FLUORESCENT LIGHTS** that were purchased by your household in 1995. Which member of the family over the age of 18 is most familiar with how these lights are used? (ASK TO SPEAK TO THIS PERSON & REPEAT INTRO)

1. How many compact fluorescent lights did you purchase in 1995? #_____ 1. _____
0 None (TERMINATE; CODE TQ1) -1 Don't Know (TERMINATE; CODE TQ1)
2. How many of these lights are currently installed? #_____ 2. _____
0 None (SKIP TO Q5) -1 Don't Know (SKIP TO Q5)
3. How many of the compact fluorescent lights that you purchased in 1995 were TURNED ON at 3 p.m. TODAY (Wednesday)? #_____ 3. _____
0 None -1 Don't Know
4. Approximately how many hours each day is each of these lights turned on?
#1_____ #2_____ #3_____ #4_____ #5_____ 4. _____

(PROMPT: "Now just to be sure, the number of compact fluorescent lights that you purchased in 1995 that were TURNED ON TODAY (Wednesday) at 3 p.m. was _____. Is that correct? (CHANGE QUESTION #3 RESPONSE, IF NECESSARY)

Now just a few last questions to help us group your answers with those of others. First . . .

5. Do you own or rent your residence? 1 Own / Buying
2 Rent / Lease 5. _____
9 Refused
6. How many people usually live in this household? _____ -1 DK/Ref 6. _____

7. How many of those are in each of the following age groups?
- | | |
|----------------------------|-----------|
| _____ 18 years and younger | 7. _____ |
| _____ 19 years - 34 years | 8. _____ |
| _____ 35 years - 54 years | 9. _____ |
| _____ 55 years or older | 10. _____ |
| <u>-1</u> DK/REF | |

10. What is the highest grade of schooling that you have completed?
(READ CHOICES IF NECESSARY)
- 1 Elementary or grammar school
 - 2 Some high school
 - 3 High School graduate
 - 4 Trade or technical school
 - 5 Some college
 - 6 Two-year college graduate
 - 7 Four-year college graduate
 - 8 Some graduate school
 - 9 Graduate degree
 - 99 (DK/REF – DO NOT READ)
11. _____

9. Into which of the following groups did your 1995 income fall?
- 1 \$7,499 or less
 - 2 \$7,500 to \$14,999
 - 3 \$15,000 to \$29,999
 - 4 \$30,000 to \$49,999
 - 5 \$50,000 to \$124,999
 - 6 \$125,000 and above
 - 9 (DK/REF – DO NOT READ)
12. _____

Thank you very much for your time and cooperation.

- Sex: 1 male 2 female
13. _____

**SDG&E CFL RETENTION STUDY
TALLY OF CALL RESULTS
PY95 BULBS - OCTOBER 1997 SURVEY**

<i>Call result</i>	<i>Number</i>	<i>Percent</i>
3 calls made	32	10.0
# not in service	7	2.2
Business/fax/pay phone /pager	3	0.9
Wrong number/wrong household	6	1.9
Language/communication problem	6	1.9
Callback	1	0.3
Refusal	42	13.2
Not available till after survey	1	0.3
Terminated at question #1	31	9.7
Out of area	1	0.3
Duplicate	1	0.3
Completed interview	<u>188</u>	<u>58.9</u>
TOTAL	319	100.0%

**SDG&E
CFL RETENTION SURVEY - #457
1995 CFL BULBS
SEPTEMBER 1998**

Hello, This is _____ from CIC Research. I'm conducting a survey for San Diego Gas & Electric Company. Is this the _____ residence? We would like to ask you some quick questions regarding the **COMPACT FLUORESCENT BULBS** that were **purchased** by your household in 1995. Are you familiar with how these light bulbs are used? **(IF NO, ASK TO SPEAK TO THE PERSON WHO IS MOST FAMILIAR & REPEAT INTRO; ARRANGE CB IF NECESSARY. IF RESPONDENT HAS NO KNOWLEDGE OF CFLs PURCHASED, PROCEED WITH INTERVIEW AND ENTER 0 FOR Q1)**

1. How many compact fluorescent BULBS did you purchase in 1995? # _____

0 None (**THANK & TERMINATE; DO NOT COUNT TOWARD QUOTA**)

-1 Don't Know (**THANK & TERMINATE; DO NOT COUNT TOWARD QUOTA**)

(IF MORE THAN 10 BULBS, ASK:) What led you to purchase _____ bulbs?

2. How many of these BULBS are currently installed? # _____
(# MUST BE LESS THAN OR EQUAL TO Q1#)

0 None

-1 Don't Know

Those are all my questions. Thank you very much for your time and cooperation.

**SDG&E CFL RETENTION STUDY
TALLY OF CALL RESULTS
PY95 BULBS – SEPTEMBER 1998 SURVEY**

<i>Call Result</i>	<i>Number</i>	<i>Percent</i>
Number not in service	145	7.0
Wrong number	164	7.9
No answer	221	10.7
Answering machine	602	29.1
Callback	91	4.4
Busy number	25	1.2
Other language	20	1.0
Refusal	104	5.0
Respondent never available	15	0.7
No knowledge of bulbs use	62	3.0
No recall of buying/receiving bulbs	111	5.4
Completed interviews	<u>510</u>	<u>24.6</u>
TOTAL	2,070	100.0%

SAN DIEGO GAS & ELECTRIC COMPANY
RESIDENTIAL LIGHTING (COMPACT FLUORESCENT FIXTURE)
PEAK-HOUR STUDY - #426
AUGUST 1996

Hello, This is _____ from CIC Research. I'm conducting a survey for San Diego Gas & Electric Company. We would like to ask you some quick questions regarding the compact fluorescent fixtures that were purchased by your household in 1995.

- A. Is this the _____ residence?
 Yes (**CONTINUE**) No (**TERMINATE**)

(TERMINATION MESSAGE: "Thank you, I'm sorry for the inconvenience.")

Which member of the family over the age of 18 is most familiar with how these fixtures are used? (**ASK TO SPEAK TO THIS PERSON & REPEAT INTRO**)

1. How many compact fluorescent fixtures did you purchase in 1995? #_____ 1. _____
0 None (**TERMINATE**) -1 Don't Know (**TERMINATE**)
2. How many of these fixtures are currently installed? #_____ 2. _____
0 None (**SKIP TO Q5**) -1 Don't Know (**SKIP TO Q5**)
3. How many of the compact fluorescent fixtures that you purchased in 1995
were **TURNU ON** at 3 p.m. TODAY (Wednesday)? #_____ 3. _____
0 None -1 Don't Know
4. Approximately how many hours each day is each of these lights turned on? 4. _____

(PROMPT: "Now just to be sure, the number of compact fluorescent fixtures that were purchased in 1995 that were TURNU ON TODAY at 3 p.m. was _____? Is that correct?" CHANGE QUESTION #3 RESPONSE, IF NECESSARY

5. Do you own or rent your residence? 1 Own / Buying
 2 Rent / Lease 5. _____
 9 Refused
6. How many people usually live in this household? _____ -1 Refused 6. _____

7. How many of those are in each of the following age groups?
- | | |
|----------------------------|-----------|
| _____ 18 years and younger | 7. _____ |
| _____ 19 years - 34 years | 8. _____ |
| _____ 35 years - 54 years | 9. _____ |
| _____ 55 years or older | 10. _____ |
8. What is the highest grade of schooling that you have completed?
(READ CHOICES IF NECESSARY)
- 1 Elementary or grammar school
 - 2 Some high school
 - 3 High School graduate
 - 4 Trade or technical school
 - 5 Some college
 - 6 Two-year college graduate
 - 7 Four-year college graduate
 - 8 Some graduate school
 - 9 Graduate degree
 - 99 (Refused)
11. _____
9. Into which of the following groups did your 1995 income fall?
- 1 \$7,499 or less
 - 2 \$7,500 to \$14,999
 - 3 \$15,000 to \$29,999
 - 4 \$30,000 to \$49,999
 - 5 \$50,000 to \$124,999
 - 6 \$125,000 and above
 - 0 No respons
12. _____

Thank you very much for your time and cooperation.

Sex: 1 male 2 female 13. _____

**SDG&E CFL RETENTION STUDY
TALLY OF CALL RESULTS
PY95 FIXTURES - AUGUST 1996 SURVEY**

<i>Call Result</i>	<i>Number</i>	<i>Percent</i>
No number	1	0.1
3 calls made	99	10.9
# not in service	18	2.0
Business/fax/pay phone /pager	29	3.2
Wrong number/wrong household	33	3.6
Language/communication problem	8	0.9
Callback	17	1.9
Refusal	72	7.9
No answer	18	2.0
Answering machine	85	9.3
Not available till after survey	14	1.5
Busy number	4	0.4
Terminated at question #1	68	7.5
Out of area	8	0.9
Duplicate	16	1.8
Completed interview	<u>421</u>	<u>46.2</u>
TOTAL	911	100.0%

**SAN DIEGO GAS & ELECTRIC COMPANY
RESIDENTIAL LIGHTING (COMPACT FLUORESCENT)
PEAK-HOUR STUDY - #457
OCTOBER 1997**

Hello, This is _____ from CIC Research. I'm conducting a survey for San Diego Gas & Electric Company.

- A. Is this the _____ residence?
 Yes (CONTINUE) No (THANK & TERMINATE; CODE "WRONG #)

(TERMINATION MESSAGE: "Thank you, I'm sorry for the inconvenience.")

We would like to ask you some quick questions regarding the **COMPACT FLUORESCENT FIXTURES** that were purchased by your household in 1995. Which member of the family over the age of 18 is most familiar with how these lights are used? (**ASK TO SPEAK TO THIS PERSON & REPEAT INTRO**)

1. How many compact fluorescent FIXTURES did you purchase in 1995? #_____ 1. _____
0 None (TERMINATE; CODE TQ1) -1 Don't Know (TERMINATE; CODE TQ1)

2. How many of these FIXTURES are currently installed? #_____ 2. _____
0 None (SKIP TO Q5) -1 Don't Know (SKIP TO Q5)

3. How many of the compact fluorescent fixtures that you purchased in 1995 were TURNED ON at 3 p.m. TODAY (Wednesday)? #_____ 3. _____
0 None -1 Don't Know

4. Approximately how many hours each day is each of these lights turned on?
#1_____ #2_____ #3_____ #4_____ #5_____ 4. _____

(PROMPT: "Now just to be sure, the number of compact fluorescent fixtures that you purchased in 1995 that were TURNED ON TODAY (Wednesday) at 3 p.m. was _____? Is that correct?" CHANGE QUESTION #3 RESPONSE, IF NECESSARY

Now just a few last questions to help us group your answers with those of others. First . . .

5. Do you own or rent your residence? 1 Own / Buying 5. _____
 2 Rent / Lease 5. _____
 9 Refused

6. How many people usually live in this household? _____ -1 DK/Ref 6. _____

7. How many of those are in each of the following age groups?
- | | |
|----------------------------|-----------|
| _____ 18 years and younger | 7. _____ |
| _____ 19 years - 34 years | 8. _____ |
| _____ 35 years - 54 years | 9. _____ |
| _____ 55 years or older | 10. _____ |
| <u>-1</u> DK/REF | |

8. What is the highest grade of schooling that you have completed?
(READ CHOICES IF NECESSARY)

- | | |
|---------------------------------------|-----------|
| <u>1</u> Elementary or grammar school | |
| <u>2</u> Some high school | |
| <u>3</u> High School graduate | |
| <u>4</u> Trade or technical school | |
| <u>5</u> Some college | |
| <u>6</u> Two-year college graduate | |
| <u>7</u> Four-year college graduate | |
| <u>8</u> Some graduate school | |
| <u>9</u> Graduate degree | 11. _____ |
| <u>99</u> (DK/REF – DO NOT READ) | |

9. Into which of the following groups did your 1995 income fall?

- | | |
|---------------------------------|-----------|
| <u>1</u> \$7,499 or less | |
| <u>2</u> \$7,500 to \$14,999 | |
| <u>3</u> \$15,000 to \$29,999 | |
| <u>4</u> \$30,000 to \$49,999 | |
| <u>5</u> \$50,000 to \$124,999 | 12. _____ |
| <u>6</u> \$125,000 and above | |
| <u>9</u> (DK/REF – DO NOT READ) | |

Thank you very much for your time and cooperation.

- Sex: 1 male 2 female 13. _____

**SDG&E CFL RETENTION STUDY
TALLY OF CALL RESULTS
PY95 FIXTURES - OCTOBER 1997 SURVEY**

<i>Call Result</i>	<i>Number</i>	<i>Percent</i>
3 calls made	35	8.5
# not in service	12	2.9
Business/fax/pay phone /pager	2	0.5
Wrong number/wrong household	8	1.9
Language/communication problem	2	0.5
Callback	2	0.5
Refusal	40	9.7
No answer	1	0.2
Answering machine	2	0.5
Not available till after survey	5	1.2
Terminated at question #1	37	9.0
Duplicate	5	1.2
Completed interview	<u>260</u>	<u>63.3</u>
TOTAL	411	100.0%

**SDG&E
CFL RETENTION SURVEY - #457
1995 CFL FIXTURES
SEPTEMBER 1998**

Hello, This is _____ from CIC Research. I'm conducting a survey for San Diego Gas & Electric Company. Is this the _____ residence? We would like to ask you some quick questions regarding the **COMPACT FLUORESCENT FIXTURES** that were **purchased** by your household in 1995. Are you familiar with how these light fixtures are used? **(IF NO, ASK TO SPEAK TO THE PERSON WHO IS MOST FAMILIAR & REPEAT INTRO; ARRANGE CB IF NECESSARY. IF RESPONDENT HAS NO KNOWLEDGE OF CFLs PURCHASED, PROCEED WITH INTERVIEW AND ENTER 0 FOR Q1)**

1. How many compact fluorescent FIXTURES did you purchase in 1995? # _____

0 None **(THANK & TERMINATE; DO NOT COUNT TOWARD QUOTA)**

-1 Don't Know **(THANK & TERMINATE; DO NOT COUNT TOWARD QUOTA)**

(IF MORE THAN 6 FIXTURES, ASK:) What led you to purchase _____ fixtures?

2. How many of these FIXTURES are currently installed? # _____
(# MUST BE LESS THAN OR EQUAL TO Q1#)

0 None

-1 Don't Know

Those are all my questions. Thank you very much for your time and cooperation.

**SDG&E CFL RETENTION STUDY
TALLY OF CALL RESULTS
PY95 FIXTURES – SEPTEMBER 1998 SURVEY**

<i>Call Result</i>	<i>Number</i>	<i>Percent</i>
Number not in service	111	6.0
Wrong number	77	4.2
No answer	329	17.9
Answering machine	430	23.4
Callback	59	3.2
Busy number	10	0.5
Other language	12	0.7
Refusal	117	6.4
Respondent never available	6	0.3
No knowledge of fixture use	57	3.1
No recall of buying/receiving fixtures	120	6.5
Completed interviews	<u>511</u>	<u>27.8</u>
TOTAL	1,839	100.0%