Addendum to Study #711:
A Re-Examination of the Net Realization Rate
For the
1996 SCG Cooking CEEI Program

Submitted to the Southern California Gas Company

By Applied Econometrics, Inc.
and
Decision Sciences Research Associates

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1. **Executive Summary**

This study was undertaken, as a result of a data request from a consultant to the Office of Ratepayer Advocates, to present a newly calculated realization rate based on total net program savings. With the advice of SCG we are using 1,199,600 therms as the best available *ex-ante* estimate of total net program accomplishments. The new *ex-post* estimate of total net program accomplishment is 593,957 therms. This is the product of 793 net therms per participant site (unchanged from the publication of Study #711), times the total number of participant sites. An improved method of accounting for individual participant sites, performed on a SCG-revised tracking data set, results in a new count of 749 participant sites, an increase of 60 sites over the number published in Study #711. The revised net realization rate for Study #711, therefore, is as follows:

$$Net\ Realization\ Rate = \frac{ex-post\ total\ net\ therms}{ex-ante\ total\ net\ therms} = \frac{593957}{1199600} = 0.495 .$$

This study also serves to note that the average net realization rate which appears in Study #711 is not properly specified. Study #711 presented the average net realization rate for the Cooking end-use of the 1996 CEEI program, as follows:

$$Net\ Realization\ Rate = \frac{ex-post\ average\ net\ therms}{ex-ante\ average\ net\ therms} = \frac{793}{749} = 1.06 .$$

This ratio is inappropriately specified because the units for the *ex-post* and the *ex-ante* averages are not the same units. The *ex-post*, an econometric result of Study #711, is an estimate of the average savings per participant location. The *ex-ante*, derived from SCG's Forecast filing, is an estimate of average savings per installed piece of equipment. Moreover, the data from the Forecast filing do not represent the best available *ex-ante* statement of 1996 program accomplishments; data from the E-Table filings are better.

2. Background & Statement of the Problem to be Solved.

On April 14, Dr. Kenneth Keating, consultant to the ORA, sent an e-mail memo to Martin Crundall at SCG asking for clarification of SCG's second earnings claim for PY96 CEEI Cooking. Dr. Keating noted that if you compare SCG's 8/24/97 E-Table filing with the 2/28/98 Study #711 filing, you see different numbers of DUOMs, different estimations of net therm program results, and alternate ways of calculating a Realization Rate. He asked whether SCG had new, revised E-3 Tables. He proposed a framework for a net realization rate based on total, rather than average, program savings.

SCG forwarded Dr. Keating's data request to the Study #711 analysis team for comment. Our task was to propose a properly-specified realization rate based on total net program savings, reconciling the Study #711 results and the E-Tables.

Carefully defining terms to avoid ambiguity and confusion: Our task was immediately complicated by the confusion surrounding the definition of such key words as "unit," "measure," and "participant." We found that it clarified our thinking to prepare a comparison, in table form followed by fairly detailed text, of the common elements of load impact analysis, under four different reporting modes or scenarios. This material is included in the Appendix. The common elements, shown in the rows of the table, are such things as: the MBtuh goal or achievement, the average size per unit, the definition of the unit, the number of units, the definition of and number of measures, the definition of and number of participants, average net savings, average gross savings, total net savings, total gross savings, the net-to-gross ratio, etc. The columns of the table represent four different reporting modes which we found it instructive to compare:
1. the "Forecast" Filing,
2. the "August '97 E-Table" Filing,
3. a "Proposed Revised E-Table" Filing, and
4. the "Study #711" Filing.

We show, for instance, how the "unit" is defined and the "number of units" calculated in each reporting environment. We also detail in the text how variables in SCG's tracking data base determine various elements in both the E-Table environment and the Study #711 environment.

Defining the elements of the realization rate equation: The next part of the task was to choose the components of the properly-specified realization rate for total net program savings. The realization rate expresses the ratio of the *ex-post* to the *ex-ante* situation. There were interesting choices to be made concerning both the numerator and the denominator of the ratio. These will be discussed separately in the following sections.

3. The Denominator of the Realization Rate: the *Ex-Ante* Total Savings Estimate

Study #711, as originally published, uses the *ex-ante* estimate of the average savings derived from the Forecast filing: 749 therms per "unit." This turns out to be a poor choice, for three reasons. First, it does not make use of the engineering estimates of per-measure savings which are now built into the SCG tracking data base. Second, the "unit" which is identified is the "typical Mbtuh installation" (average size = 109 Mbtuh) based on the 1991 program results. It is not exactly clear how many individual pieces of equipment this represents, but it seems likely that it does not correspond to the definition of the Study #711 *ex-post* "unit" (i.e., one participant kitchen site, including all equipment installed at that site). Because of this difference in the definition of *ex-ante* and *ex-post* "units," the most charitable thing we can say about the average net realization rate presented in the beginning of our Study #711 is that it requires tiring mental effort to interpret correctly; we could also describe it, less charitably, as absurd. Third, it is difficult to determine the number of "units" we would have to multiply it by in order to calculate the total net program savings.

The best candidate for the *ex-ante* total net program savings would seem to be derived directly from Table E-3 (at the line labelled "Net Therm Savings"). For cooking, this data item is determined in the following way. Each cooking measure in the SCG tracking data base is associated with an engineering estimate of gross therm saving derived from the Blitzer or CookCalc software. The "Net Therm Savings" is the sum of the gross therm savings for all rebated cooking measures, multiplied by the constant 0.75 net-to-gross. The August/97 E-3 Table shows a total of 1,361,125 "Net Therm Savings" for the 1996 Cooking. SCG advises that an adjustment to this figure is necessary because of a programming error in the statement which selected the qualifying measure records for the data set feeding this part of the 8/97 E-Table filing. The correct gross savings is 1,599,467 therms, which, having been multiplied by the standard 0.75 net-to-gross, would result in total net savings of 1,199,600 therms. We use this latter figure in the denominator of the new net realization rate based on total program savings. Note that this data item is completely independent of the number of "units" or participants.

4. The Numerator of the Realization Rate: the *Ex-Post* Total Savings Estimate

The total program *ex-post* savings estimate is necessarily the product of two separate elements. The first element, the average savings estimate of 793 net therms per participant site, is the primary result of Study #711. This average net load impact is computed using the *difference of differences* method outlined in Table 5 of the Protocols. By this method, the net load impact is computed by subtracting the change in nonparticipant consumption from the change in participant consumption, after controlling for size and weather differences between participants and nonparticipants.

The data from the telephone-contacted participant kitchens of which the study population is composed have not changed, nor have we found any other evidence to suggest that it would be appropriate to re-specify or re-estimate the econometric model. Therefore the average savings estimate stands, as originally published.

The second element, the estimated number of participant sites, originally published in Study #711, Tables 6 and 7, as 689 individual sites. It seemed appropriate--in fact, necessary--to take a fresh look at the estimate of the total number of kitchen locations which were participants in the 1996 program. The tracking data set which feeds the E-Tables also feeds the Study #711 count of participants and, as noted above, this subset of the tracking data had changed.

The main subset of the program data which was used for Study #711 sample design was sent from SCG to DSRA in June of 1997. The program data consisted of two major components: (1) measure records from the SCG CEEI tracking data base, and (2) billing records for SCG accounts appearing in the measure records. The billing data was supposed to be matchable to the tracking data by matching on SCG account number and/or premise number. No such matching process is ever perfect, but this one presented a special challenge (especially to Ken Parris, who was primarily responsible for retrieving the relevant billing records to send to DSRA from SCG) caused by a large-scale SCG re-assignment of account numbers during 1996; in fact, the format of the account number changed. This meant that the account number posted to the tracking data base was sometimes the earlier and sometimes the later format. Two additional data "refreshes" were transmitted later in the summer, to capture any 1996 program measures which might have been entered into the tracking data base after June, and also to supply billing records for some accounts which had been difficult to match. Only measure records which matched some billing records were eligible to enter the participant sample frame and would therefore have figured into the determination of the number of participant sites. We refer to this collection of tracking and billing data as the "June 1997" data, in spite of some of it having arrived in August.

In May, 1998, after Dr. Keating's data request was received, SCG sent the revised subset of tracking data (revised on the basis mentioned above) to DSRA. SCG has given its approval to this data set as the "best and final" statement of the 1996 program accomplishments in terms of MBtuh installed and ex-ante (engineering-based) estimate of total therm savings. The re-estimation of the total number of 1996-Program participant kitchen sites was performed by DSRA and based on a detailed comparison of the "June 1997" data with the "May 1998" revised tracking data. DSRA requested that the company name, customer name, address, and premise number be sent also. Constructing a scheme (using premise number in addition to the name and address fields) to identify individual kitchen sites, DSRA performed a comparison of the data sets and an improved count of individual participant kitchen sites, resulting in a net gain of 60 identified participant sites, as follows:

	Sites	Measure Records	Gross Therm Savings	Installed MBtuh
Previously Known Sites	656	952	1,336,009	139,936
New Participant Sites	93	157	263,465	27,291
Totals	749	1,109	1,599,474	167,227

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The *ex-post* estimate of the total savings attributable to the 1996 cooking program, then, is as follows:

$$(793 \, net \, therms \, / \, participant \, site) \times (749 \, participant \, sites) = 593{,}957 \, net \, therms \, .$$

5. Calculation of the Net Realization Rate Based on Total Program Savings

Putting together the ex-ante and the ex-post estimates of total net therms attritubale to the 1996 SCG cooking program, we see that the revised net realization rate for Study #711, is as follows:

$$Net \, Realization \, Rate = \frac{ex\text{-}post \, total \, net \, therms}{ex\text{-}ante \, total \, net \, therms} = \frac{593957}{1199600} = 0.495 \, .$$

6. Appendix: A Comparison of Various Parameters of the Load Impact Estimation of the SCG Cooking CEEI Program, Under Four Different Reporting Modes

Table 1. A Comparison of Elements
of the Load Impact Estimation
for the 1996 Cooking CEEI Program

	Forecast Filing	August '97 E-Table Filing	Proposed Revised E-Table Filing	Study #711 Filing
Input Goal or Actual (Rebated MBtuh)	125,000	188,929.9	167,224.9	n/a
Average Input	109 MBtuh	109 MBtuh	109 MBtuh	n/a
Number of "Units"	1146.78	1,733.3	1,534 (calculated)	689 (original) 749 (revised)
What is a "Unit"?	Also referred to as a "measure," probably refers to an individual piece of rebated cooking equipment.	Total installed MBtuh divided by 109	Total installed MBtuh divided by 109 or pieces of rebated equipment	A participant location (a kitchen), including all pieces of rebated equipment installed at that site. The Protocol-defined "d.u.o.m."
Load Impact: Average Gross	998 therms per "measure"	1047.04 therms per "unit"	1042.68 therms per "unit"	(See text discussion)
Load Impact: Total Gross	1,144,495 therms	1,814,833 therms	1,599,467 therms	(See text discussion)
Net-to-Gross	0.75	0.75	0.75	(See text discussion)
Load Impact: Average Net	749 therms per "measure"	785.3 therms per "unit"	782 or 917 therms per "unit"	793 therms per "unit"
Load Impact: Total Net	**858,938 therms**	**1,361,125 therms**	**1,199,600 therms**	**546,377 (original) 593,957 (revised)**
Total # MBtuh	125,000	188,930	167,225	
Total # Measures	1146.78	not shown	1308	
Total # Measure Records	N/A	not shown	1109	965
Total # Participants	N/A	not determined	not determined	Same as "units"

Discussion of Table Entry Items:

1. The "Forecast Filing" Column

The source of the data in the "Forecast" column of the table is the printed report, " SCG DSM Advice Letter Attachments, 1996 DSM Programs," dated October 1, 1995. The numbers and the names attached to the numbers are taken directly from the document.   Wherever our current understanding of the data comes from conversation with SCG rather than from the documentation I've indicated this by the use of square brackets [ ].

The interesting feature of the forecast filing, for our present problem-solving purpose, is that the "units" of program implementation are referred to as "measures" and are probably equivalent to individual pieces of rebated cooking

equipment. That is, one griddle (or steamer or whatever) would be identified as one "measure" and equivalent to one "unit."

The logical development of the forecast filing is as follows.

Measure-specific Inputs (Implementation Goals)

- **"Measure Goal", a.k.a "Input Goal"**
  First the "Measure Goal" for the 1996 program was set at 125,000 MBtuh. According to the documentation, the goal for the 1996 program was based on the 1994 program results. [This goal refers to the sum of the rated input values for all of the pieces of cooking equipment which were anticipated to be installed and rebated under the terms of the 1996 program.]

- **"Average Input"**
  Next, the "Average Input" per "measure" is given as 109 MBtuh. According to the documentation, this number was based on the 1991 program results. [This number is the average nameplate MBtuh input for the set of individual pieces of cooking equipment for which a rebate was given during PY 1991.]

- **"Number" (of "Measures")**
  The number of measures, is then calculated by dividing the MBtuh Goal by the Average Input; this number turns out to be 1146.78.

Measure-specific Inputs (Energy Savings Inputs)

- **Gross Average Annual Savings**
  The gross annual savings per "measure" is estimated at 998 first-year therms. According to the documentation, this estimate of gross savings is derived from the November, 1993 commercial DSM impact analysis performed for SCG by Ron Rudkin (Analysis Group.)

Measure-specific Calculations (First-Year Savings)

- **Net-to-Gross Ratio**
  The net annual savings per "measure" is calculated by multiplying the gross savings by the Net-to-Gross Ratio. According to the documentation, the 1993 Rudkin/Analysis Group study had estimated the net-to-gross ratio for the cooking element at 0.88; this figure was, however, revised downward to be consistent with the 0.75 default assumption for most of the other elements of the CER program.

- **Net Average Annual Savings**
  The net annual savings per "measure" thus is calculated as 749 therms -- that is, 998 therms (first-year gross savings) times 0.75 (net-to-gross ratio).

Measure-specific Calculations (Costs Data)

- **Total Gross Savings**
  The total first-year gross savings is then calculated as the product of the estimated gross therms per measure times the estimated number of installed measures: 1,144,495 therms.

- **Total Net Savings**
  The total first-year net savings does not make an explicit appearance in the Forecast filing, but if it did it would be calculated as the product of the net therms per measure times the estimated number in installed measures: 858,938.22 therms.

2. The "August '97 E-Table Filing" Column

The source of the data below is the Excel workbook, E96-SS.XLS.. The workbook shows which variables are calculated internally and which are entered from exogenous sources, which sources are explicitly cited. **Total MBtuh installed**

To compare with the *ex-ante* goal of 125,000 installed MBtuh, SCG presents, in its August, 1997 E-Table filing, the *ex-post* achievement of 188,930 installed MBtuh. This figure appears in Table E-2, and it enters the E-Table Excel workbook from the exogenous source:

    CEMODELS\ACTUAL\CER_A.XLW, Row = "Measure_2", Column = "GoalInput".

[This represents the sum of the rated inputs for all pieces of equipment installed under the terms of the 1996 program for which a non-zero rebate amount was paid. It is the sum of the "rated input" field in the tracking data base for all cases which satisfy conditions of type and completion.]

- **Average Size (MBtuh) per Unit**
  [The average MBtuh per "unit" does not make an explicit appearance in the E-Table workbook. It is not calculated by dividing the total installed MBtuh by the number of "units" or of "measures" or of pieces of equipment or of any other

data item from the tracking data base. It is not a variable in the current analytical environment; it is a constant. It is defined as 109 installed MBtuh, adopted without modification from the forecast filing sources discussed above. Although the 109 MBtuh constant does not appear in the E-Table workbook, it is nevertheless used to calculate variables which do appear explicitly in the E-Tables, such as the "number of units;" in fact, it determines the definition of the term "unit" as used in the E-Table environment.]

- **Number of Units**

  The "# of units" is shown, in Table E-3, as 1,733. It enters the workbook from the exogenous source:
  CEMODELS\ACTUAL\CER_A.XLW, Row = "Measure_2", Column = "GoalNumber".
  [Unlike the total installed MBtuh data item, the number of units is not derived as the sum of any field in the tracking data base. It is not the count of, for instance, individual pieces of rebated cooking equipment resulting from the PY96 program activities. Rather, it is calculated by dividing the total installed PY96 MBtuh by the 109 MBtuh constant discussed immediately above. Thus, a "unit," in the E-Table filing environment, is *defined* as 109 installed & rebated MBtuh.]

- **Average Gross Savings Per Unit**

  The "average load impacts per unit (gross)", (Table E-3, Cell H-11), is shown to be 1047.04 therms per "unit," where the "unit" is understood, as above, to be 109 rebated MBtuh. This figure enters the E-Table workbook from the outside source:
  CEMODELS\ACTUAL\CER_A.XLW, Row = "Measure_2", Column = "GAnThermSav".
  [The gross savings per unit is calculated within the tracking data base as the sum of the therm savings estimates for all of the rebated cooking measures, divided by the total number of installed MBtuh for all completed rebated measures, and multiplied by the 109 MBtuh per "unit" constant. The therm savings estimate is a variable ("ThermSavings") associated with each cooking measure in the Measure table of the tracking data base; it is an engineering-type estimate derived from SCG's "Blitzer" database or from the CookCalc program.

- **Total Gross Savings**

  Total Gross Savings is calculated within the E-Table workbook. Specifically, it appears as the variable TOTTHMSAV, on the "Feeder" Sheet in Cell T27, and it is internally documented to be the product of the number of units (PUNITS, Feeder sheet, Cell O27) times the gross savings per unit (THMSAVUNIT, Feeder Sheet, Cell P27.) It does not appear *per se* in Table E-2 or Table E-3.

- **Net-to-Gross Ratio**

  The assumed Net-to-Gross ratio of 0.75 does not change from the Forecast Filing.

- **Average Net Savings Per Unit**

  The average net savings does not appear *per se* in the E-Table workbook, but it is implied to be the gross savings per unit times the net-to-gross ratio, which calculation would put it at 785.3 therms per unit (1047.04 gross therms per unit * 0.75 net therms per gross therm), where a unit is defined as 109 rebated MBtuh.

- **Total Net Savings**

  Net Therm Savings (total) is one of the critically important variables on Table E-3. For the Cooking element, the total is 1,361,125 therms. It is the product of three other Table E-3 variables: gross therms per unit * number of units * net-to-gross ratio.

3. The "Proposed Revised E-Table Filing" Column

The source of the data below is an Excel data set, CER_COOK.XLS, a current subset of the tracking data base sent by Martin Crundall to DSRA on May 18. It represents all the cooking measure records for which a non-zero PY96 rebate has been paid, and therefore should yield the most accurate and up-to-date summary of program accomplishments in terms of MBtuh installation and estimated gross total therm savings. The measure records include a count of the number of measures installed (where a measure is understood to be an individual piece of equipment), an engineering estimate of the therm savings expected to be achieved by each measure, the rated input (MBtuh) of the rebated equipment, and the dollar amount of the rebate paid.

- **Total MBtuh installed**

  The revised data set shows a PY96 accomplishment of 167,225 installed MBtuh. This is the sum of the "total rated input" variable for all measure records. If the revised data set were to be used as the basis of a revised E-Table filing, 167,225 total MBtuh would enter the E-Table workbook as an exogenous variable (assuming that it is the same value as would appear in CEMODELS\ACTUAL\CER_A.XLW, Row = "Measure_2", Column = "GoalInput"), it would pass through the workbook without modification, and make its intact appearance in Table E-2, in the "Number of Units"

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column, "Cooking" sub-column. (A note: In Table E-2, "units" means "MBtuh". This can be mildly confusing to the initiate, but it's okay, because the internal logic is pretty easy to follow.)

- **Average Size (MBtuh) per Unit**
  The data base shows an actual count of 1308 units, if we think of units as "measures," or individual pieces of installed and rebated equipment. If we divide 167,225 total installed MBtuh by the number of thus-defined units, we get 127.85 MBtuh per unit. However, SCG does intend to continue to employ the 109 MBtuh/unit constant used in the current E-Table.

  Recall, from the above discussion, that this variable does not make an explicit appearance in the E-Table workbook. It is not calculated within or entered explicitly into the E-Table workbook. It may be shy, but it is very powerful. It directly drives several elements of load impact analysis.

- **Number of Units**
  The number of units, if a unit is a piece of rebated equipment, is 1308; this is determined by counting them in the data base. On the other hand, the number of units, if a unit is any aggregate of 109 installed MBtuh, is 1534; this is determined by dividing the total installed MBtuh by 109.

  If the revised data set were to be used as the basis of a revised E-Table filing, it would appear first in the external source: CEMODELS\ACTUAL\CER_A.XLW, Row = "Measure_2", Column = "GoalNumber". From there it enters the E-Table workbook and appears without modification in Table E-3.

- **Average Gross Savings Per Unit**
  The value of average gross savings also depends on the definition of the unit. It is calculated within the tracking data base as the sum of the gross therm savings estimates (the ThermSavings variable) for all of the rebated cooking measures, divided by the total number of units. The total gross savings is 1,599,467 therms. If we divide this by the number of rebated measures (1308), we get 1222.8 gross therms per measure. If we divide instead by the number of 109-MBtuh units, we get 1042.68 gross therms per unit.

  If the revised data set were to be used as the basis of a revised E-Table filing, this figure (1222.8 or 1042.68 gross therms per unit) would enter the E-Table workbook from the outside source:
  CEMODELS\ACTUAL\CER_A.XLW, Row = "Measure_2", Column = "GAnThermSav".
  Then it would appear as "average load impacts per unit (gross)", in Table E-3, Cell H-11.

- **Total Gross Savings**
  The total gross savings is the sum of the "ThermSavings" variable (derived from CookCalc/Blitzer software) for all the measures in the tracking data base. It is 1,599,467 therms.

  Recall from above that Total Gross Savings is calculated within the E-Table workbook. Specifically, it appears as the variable TOTTHMSAV, on the "Feeder" Sheet in Cell T27, and it is internally documented to be the product of the number of units (PUNITS, Feeder sheet, Cell O27) times the gross savings per unit (THMSAVUNIT, Feeder Sheet, Cell P27.) It does not appear *per se* in Table E-2 or Table E-3.

- **Net-to-Gross Ratio**
  The assumed Net-to-Gross ratio of 0.75 would not change from the Forecast Filing and the prior E-Table filing.

- **Average Net Savings Per Unit**
  The average net savings does not appear *per se* in the E-Table workbook, but it is implied to be the gross savings per unit times the net-to-gross ratio, which calculation would put it at 782 therms per unit (1042.68 gross therms per unit * 0.75 net therms per gross therm), where a unit is defined as 109 rebated MBtuh, or, alternatively, at 917 therms per unit, where a unit is defined as one rebated piece of equipment.

- **Total Net Savings**
  Recall from above that Net Therm Savings (total) is one of the critically important variables on Table E-3. For the Cooking element, the total derived from the revised worksheet would be 1,199,600 therms. It would be calculated as the product of three other Table E-3 variables: gross therms per unit * number of units * net-to-gross ratio. It is therefore independent of the definition of the "unit."

4. The "Study #711 Filing" Column
Source:
The source of data in this column is the Study #711 document: First-Year Load Impacts Of SCG's PY96 CEEI Program, submitted to SCG by Applied Econometrics Inc. and Decision Sciences Research Associates, February 28, 1998.

Definition of "measure" for Study #711:
At the beginning of Study #711 the analysis team discussed with SCG what the appropriate measurement unit should be. Our primary resource for this task was the Protocol requirements. The Protocol requirements specify (Table C-4) that the "designated units of measurement" for the Gas Cooking End-Use of CEEI Program are: load impacts per project. From 4/11/97 on, the documentation for Study #711 shows that the DUOM selected for this study is defined as load impacts per project. The "project" was defined as the "overall per-customer installation, including all rebated equipment items together." We can think of it as one kitchen. In the case of participants, the number of participants equals the number of participant "projects."

Influence of the definition of "measure" on Table 6:
Since the "measure" (the DUOM) is defined as the project, Table 6 for Study #711 shows the number of "measures" to be equal to the number of "participants." Line 6A shows that the "number of measures installed by" those participants included in the study group (which is equal to the number of participant kitchens included in the study group) is 347. Line 6B shows that the "number of measures installed by" all program participants during the 12 months of the program year (which is equal to the total number of 1996 CER Cooking participants) was estimated at 689. Table 7 documents how these numbers of participants were determined from the participant data base which we received.

The number of participants included in the study group (Table 6, Line 6A) is precisely determined within the scope of Study #711 and is not open to re-interpretation. That is, the number of participant kitchens included in our study was exactly 347, and their selection, history, and characteristics can be found described within the study.

By contrast, the total number of participants in the 1996 program (Table 6, Line 6B) is an estimate based on the data base selection which was sent in June of 1997 to support Study #711, and this estimate is open to re-calculation if that data base selection is in any way inconsistent with the "best and final" version of the data base.

Analysis of the original data base selection with a revised data base selection sent in May '98 indicated that the more correct number of program participant locations was 749..

Misidentification of the meaning of "measure" in the Forecast Filing:
At the beginning of Study #711, the study team had access to the Forecast Filing, and we had conversations with SCG about the meaning of the term "measure" as used in the context of the Forecast. We were told that the "measure" in that context meant "an installation," and was larger than a single piece of equipment. We formed the opinion that the "measure" referred to in the Forecast Filing was the very same "measure" that we had identified as our designated unit of measurement for our study: that is, a collection of cooking equipment efficiency upgrades which had been installed and rebated at a customer's location. (It is our recent, revised understanding that a "measure," in the context of the Forecast Filing, refers to an individual piece of cooking equipment.) Therefore, we took from the Forecast Filing the estimate of 749 therms as SCG's best available *ex-ante* estimate of the net load effect per customer. This had the unfortunate effect of presenting the *ex-ante* and the *ex-post* savings as variables measured in the same terms whereas in reality they are measured in different terms.

Calculation of load impact variables:
The explanation below follows the internal logic of Study #711 and shows the order in which the load impact estimates are determined.
- **Average Net Savings Per Unit**
  Study #711 directly computes the average net load impact, in annual therms per-participant. The average net load impact is computed using the *difference of differences* method outlined in Table 5 of the Protocols. By this method,

the net load impact is computed by subtracting the change in nonparticipant consumption from the change in participant consumption, after controlling for size and weather differences between participants and nonparticipants.

The average net load effect was found to be 793 therms per participant.

- **Number of Units**
  In Study #711, the "unit" (as in designated unit of measurement) is the participant location, including all rebated pieces of equipment present at that location.

  Study #711 estimated the total number of 1996 program year participants at 689, based on the analysis of the selection from the tracking data base which was sent in June 1997 to support the sample design for the study. The revised estimate presented in this Addendum is 749 participant locations.
- **Total Net Savings**
  The total net savings is computed by multiplying the average net savings per participant by the estimated number of participants. Study #711 calculated the total net savings at (689 participants) * (793 net annual therms per participant) = 546,377 annual net therms.
- **Average Gross Savings Per Unit**
  The participant gross impact is computed as the total estimated change in consumption from 1995 to 1997 for the program participants. Because cooking usage increased from the pre- to the post-period in our study, the average gross "savings" impact is negative. (The value is -201 therms.)
- **Total Gross Savings**
  Total gross savings is equal to the average gross savings per participant, times the number of participants.
- **Net-to-Gross Ratio**
  The net-to-gross ratio is difficult to interpret, because the gross impact is negative.