Extrapolations from the Protocols
August 31, 2002

The Protocols And Procedures For The Verification Of Costs, Benefits, And Shareholder Earnings From Demand-Side Management Programs (Protocols) is a document that has been adopted by the California Public Utilities Commission. As such, any change or addition to the Protocols requires processes to add to a public document. The information presented herein constitutes what may be considered extrapolations to information presented in the Protocols. The last formal revision to and adoption of the Protocols occurred in 1999. However, certain issues addressed by the Protocols have not remained static.

There are no known advances on the information presented in appendices A, B, C, D, E, G, or J of the Protocols as of August 31, 2002. However, the energy efficiency community has developed updated or additional information pertaining to the subjects covered by appendices F, H, I, and Z. This added information is provided here, for the users information, with the caveat that it has not in any way been sanctioned as part of the adopted Protocols.

Added information pertaining to Appendix F
EFFECTIVE USEFUL LIFE VALUES FOR MAJOR ENERGY EFFICIENCY MEASURES

On July 6, 2000, Decision 00-07-017 was issued by the California Public Utilities Commission (CPUC). This decision addressed a number of issues and included 96 ordering paragraphs covering energy efficiency programs, their cost-effectiveness, and the need for public workshops. Ordering Paragraph #8, stated:

> The utilities shall, jointly with interested stakeholders, after engaging in a public process, devise a table showing the proposed measure life for each energy efficiency measure included in their programs. The table shall be included in the PY 2001 applications and include a description of any remaining areas of disagreement. The utilities shall use the agreed upon values in their PY 2001 applications subject to our approval. As a general rule, the utilities shall use the same measure life in the cost-benefit calculations, particularly for statewide programs. Where there is a reason for varied measurement lives, the table should include agreed-upon variations, and, in the PY 2001 application, the utilities shall explain the basis for the variations. (Decision 00-07-017, Ordering Paragraph #8, pp. 251)

There following eleven pages comprise the report filed on Ordering Paragraph #8. The proposed EUL values were accepted by the CPUC in the ruling of 10/25/00 whereby the values to be used for cost effectiveness were outlined and used in the CPUC Energy Efficiency Policy Manual of November 29, 2001.

Proposed Effective Useful Life for Measures for PY2001 Program Elements

Report Issued Prior to Public Meeting

Response to Ordering Paragraph #8

Discussion Paper 2

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

September 5, 2000

1. Introduction

On July 6, 2000, Decision 00-07-017 was issued by the California Public Utilities Commission (CPUC). This decision addressed a number of issues and included 96 ordering paragraphs covering energy efficiency programs, their cost-effectiveness, and the need for public workshops. The focus of this report is Ordering Paragraph #8, which states:

> The utilities shall, jointly with interested stakeholders, after engaging in a public process, devise a table showing the proposed measure life for each energy efficiency measure included in their programs. The table shall be included in the PY 2001 applications and include a description of any remaining areas of disagreement. The utilities shall use the agreed upon values in their PY 2001 applications subject to our approval. As a general rule, the utilities shall use the same measure life in the cost-benefit calculations, particularly for statewide programs. Where there is a reason for varied measurement lives, the table should include agreed-upon variations, and, in the PY 2001 application, the utilities shall explain the basis for the variations. (Decision 00-07-017, Ordering Paragraph #8, pp. 251)

Beginning with the PY 1994 demand-side management (DSM) programs, evaluations of these programs implemented by PG&E, Edison, SDG&E, and SoCalGas were conducted in accordance with a specific set of measurement and evaluation protocols, the *Procedures for the Verification of Costs, Benefits, and Shareholder Earnings from Demand-Side Management (DSM) Programs* (M&E Protocols). The M&E Protocols Appendix A includes two definitions of measure life. The Effective Useful Life (EUL) which is defined as "an estimate of the median number of years that the measures installed under the program are still in place and operable." The Engineering Useful Life is defined as "An engineering estimate of the number of years that a piece of equipment will operate if properly maintained." Since Ordering Paragraph 8 is unclear on which "measure life" the utilities are to document, it is assumed that the EUL is the "measure life" referred to in Ordering Paragraph 8. The EUL is the term used throughout the M&E Protocols to calculate utility earnings so it would be the more referenced.

The M&E Protocols include Appendix F that lists the EUL for each measure planned as of approximately 1993 (Appendix F is undated). Where the measures listed in Appendix F are still being offered in PY 2001, these values were used as a point of reference in the analysis.

As required by the M&E Protocols, one of the products of planned DSM evaluations were EUL studies at prescribed intervals. As of July 7, 2000, 133 of these studies have been completed according to the CADMAC web site. A list of these studies is included in Table 1. To date, since most measures are still early in their EUL, these studies have resulted in a change in EUL for only one measure (compact fluorescent lamps in the commercial sector for SCE).

The remainder of this report will discuss the methods used to comply with Ordering Paragraph #8 and the recommendations for EULs for anticipated PY 2001 measures.

2. Methods

Ordering Paragraph #8 requires documentation of the EULs for planned PY 2001 measures. Since actual PY 2001 programs have not yet been filed, the utilities current measures for the PY 2000 programs were used as the basis for approximating PY 2001 measure mix.

The first step in the assessment was to document all current information on measures planned for PY 2001 by the utilities. To obtain this information, each utility was asked for a complete list of PY 2000 measures and current EULs. There were approximately 775 measures from the four utilities that were then mapped to the measure numbers from the M&E Protocols Appendix F and sorted by end use and measure type. However, since new measures had been added since Appendix F was compiled, some measures had no Appendix F historical data. These were given new measure numbers.

The next step was attempt resolve the EUL for measures where conflicting values existed. Three "rules" were applied to resolve many of the issues.

- Where two utilities had one value and one utility had another, the "mode" (the most common value) was selected as the appropriate EUL value.
- Some values were changed to create consistency across common measure types (e.g., common types of lighting fixtures) when the change was small.
- When numbers were very close (e.g., 15.3, 15.0, and 15.4) the nearest round number was proposed (e.g., 15.0)

This process left a limited number of measure types requiring input from utility staff. These remaining measures were jointly reviewed by the four utilities and agreed default values were selected. In many cases the EUL was resolved simply by confirming existing values as valid or supplying information previously unavailable.

3. Recommendations

Tables 2 through 5 present the proposed EULs for the PY 2001 Programs by sector. Table 2 presents the proposed measures for the Nonresidential Measures, Table 3 for the Residential Measures, Table 4 for Program Level Measures, and Table 5 for Other Measures that for various reasons could not be categorized.

Proposed Effective Useful Life for Measures for PY2001 Program Elements
Report Issued Prior to Public Meeting

Response to Ordering Paragraph #8

Discussion Paper 2
Attachment A

Pacific Gas and Electric Company
Southern California Edison Company

San Diego Gas and Electric Company
Southern California Gas Company

September 5, 2000

Retention Studies Listed on CADMAC Site as of 7/7/00

ID	*Num*	*Utility*	*Title*	*Publ*	*Summary*	*Prog Yr*
322	322.00	PG&E	1994 Residential New Construction	1-Mar-97		1994
384BR1	384.00	PG&E	Retention Study of Pacific Gas and Electric Company's 1994 and 1995 Residential Appliance Efficiency Incentives Program: 1994 Lighting	1-Mar-97	See study 384CR1 which incorporates this study.	
384AR1	384.00	PG&E	Retention Study of Pacific Gas and Electric Company's 1994 and 1995 Residential Appliance Efficiency Incentives Program: 1994 Refer.	1-Mar-97	See study 384CR1 which incorporates this study.	
524	524.00	SCE	Southern California Edison 1994 Residential CFB Manufacturers' Incentive Program: Fourth Year Retention Study	1-Mar-98	This report estimates survival of residentially installed compact fluorescent bulbs subsidized by SCE's 1994 manufacturers' incentive program -- using conservative survival modeling techniques over a collection of sample surveys performed by various vendors in 1995, 1997 and 1999. The study reveals that (1) bulb estimated expected useful life, allowing for burnouts, remodels, accidents, and migration from the SCE territory, is approx. 6.1 years over the sample: (2) the standards error of 0.59 years obtained from the study indicates that SCE's filed assumption of 5.8	
915	915.00	SDGE	1994 & 1995 Residential Appliance Efficiency Incentives: Refrigerators: Fourth Year Retention Evaluation	1-Mar-98	Fourth year retention evaluation of refrigerators component of the 1994 and 1995 residential appliance efficiency inicentives. Telephone research was contracted to CIC Research, Inc. Used a model for lifetime estimation consisting of survivor function, hazar function, adn median lifetime components. Data are applied to a maximum-likelihood framework to produce estimated median	
921	921.00	SDGE	1994 & 1995 Residential Appliance Efficiency Incentives: Compact Fluorescent Lights: Fourth Year	1-Mar-98	Same approach as study #915. Results showed realizastion rate of 1.36 for CFL Bulbs and 1 for CFL Fixtures.	
924	924.00	SDGE	1994 & 1995 Commercial Energy Efficiency Incentives: Fourth Year Retention Evaluation	1-Mar-98	See Study #960 which incorporates this study.	
927	927.00	SDGE	1994 & 1995 Industrial Energy Efficiency Incentives: Fourth Year Retention Evaluation	1-Mar-98	See Study #963 which incorporates this study.	
930	930.00	SDGE	1994 & 1995 Agricultural Energy Efficiency Incentives: Fourth Year Retention Evaluation	1-Mar-98	See Study # 966 which incorporates this study.	
933	933.00	SDGE	1994 & 1995 Residential New Construction Program: Fourth Year Retention Evaluation	1-Mar-98	This study attempted to review the ex ante retention estimates of the 1994 and 1995 res new construction program measures. Measures were A/C SEER 11 and 11.1, High performance glass, and r19 Wall Insulation.Surveys were made of participants from a sample. Econometric framework included modules for survivor function, hazard function, median lifetime. These concepts are applied to the data and a maximum-likelihood framework (which brings the modules and data together) to produce estimated median lifetimes. Dependent and independent failures	
936	936.00	SDGE	1994 & 1995 Nonresidential New Construction Program: Fourth Year Retention Evaluation	1-Mar-98	See Study #972 which incorporates this study.	
939	939.00	SDGE	1994 Commercial Multiple Enduses - 1st Persistance Study	1-Mar-98		
942	942.00	SDGE	1994 Industrial Multiple Enduses - 1st Persistance Study	1-Mar-98		
945	945.00	SDGE	1994 Agricultural Multiple Enduses - 1st Persistance Study	1-Mar-98		
341R	341.00	CADMAC	Final Report: Statewide Study of the Retention of Measures Installed Under the Direct Assistance Program (DAP)	29-Dec-98	See Study #975 which incorporates this study.	
571	571.00	CADMAC	Final Report: Statewide Study of the Retention of Measures Installed Under the Direct Assistance Program (DAP)	29-Dec-98	See Study # 975 which incorporates this study.	
713	713.00	CADMAC	Final Report: Statewide Study of the Retention of Measures Installed Under the Direct Assistance Program (DAP)	29-Dec-98	See Study # 975 which incorporates this study.	
525A	525.00	SCE	1994 Residential Appliance Efficiency Incentive Program Fourth Year Retention Study: Final Report	1-Feb-99	This is a study of the 4th year retention of space cooling appliances and refrigerators installed by customers of SCE in 1994 under its res. appliance efficiency incentive program.Data was collected via phone and mail. Appliances were: Central A/C, heat pumps, evap. coolers, and refrigerators. The percent of applainces retain since 1994 to 1998 were from 94% for evap. coolers to 98.2% for central A/C units. Effective useful life for refrs. was 21.8 years, for central A/C was 22.04	
525B	525.00	SCE	Persistence Study of Southern California Edison's 1994 through 1997 Appliance Recycling Programs	25-Feb-99	This is a fourth-year retention study of SCE 1994 through 1997 Appliance Recycling Programs. See Studies #515 and #537. Measure retention data was collected from a sample of participants and a parametric survival function ws fitted to the data. The median life of the diredct measure removal -- i.e. the time until half the removed units ahve been replaced -- is estimated at 6.3 years, with an 80 percent confidence interval of 5 to 7.5 years. The result is based on the combined	
310R1	310.00	PG&E	Fourth Year Retention Study for Pacific Gas & Electric Company's 1994 Commercial Energy Efficiency Incentives Programs: Lighting and HVAC Technologies: Lighting	1-Mar-99	See Study 312R1 which incorporates this study.	
311R1	311.00	PG&E	1994 - 1995 Industrial Energy Efficiency Incentive Programs: Third - Year Retention Study: Process End Use (1994)	1-Mar-99	See Study 325R1 which incorporates this study.	
312R1	312.00	PG&E	Fourth Year Retention Study for Pacific Gas & Electric Company's 1994 Commercial Energy Efficiency Incentives Programs: Lighting and HVAC Technologies	1-Mar-99	This study measures the effective useful life (EUL) for all HVAC and lighting EE technoligies for which rebates were paid in 1994 by PGE's Commercial EEI programs. We have attempted to employ classical survival analysis techniques to our study approach. Most measrues were in place less than 5 years; because the ex ante EUL is 15-20 years for most measures, the data will not likely be capable of accurately est. the survival function for these measures.The method was to (1) compile summary statistics on the raw retnetion data; (2) visually inspect the retention data--this showed the lack of needed data for analysis; (3) develop a trend line from the survival plots; (4) develop a survival function using classical survival techniques such as exponential, logistic, logonrmal, Weibull and gamma. Results. Later studies are needed to determine tru values of EUL	
314R1	314.00	PG&E	1994 - 1995 Industrial Energy Efficiency Incentive Programs: Third - Year Retention Study:Indoor Lighting End Use (1994)	1-Mar-99	See Study 325R1 which incorporates this study.	
315R1	315.00	PG&E	Retention Study of Pacific Gas and Electric Company's 1994 and 1995 Energy Efficiency Incentives Program, Agricultural Sector M	1-Mar-99	See Study 331R1 which incorporates this study.	
321R1	321.00	PG&E	Retention Study of Pacific Gas and Electric Company's 1994 and 1995 Energy Efficiency Incentives Program, Agricultural Sector M	1-Mar-99	See Study #331R1 which incorporates this study.	1994 1995
322R1	322.00	PG&E	Pacific Gas and electric Company: PY94 Residential New Construction: Retention Study	1-Mar-99	The purpose of the 1994 Res. New Construction retention study was to collect data on the fraction of installed measures that are still 'in place and operating' to produce a revised est. of PY94 effective useful lifetimes (EULs) of the measures. The method was divided into (1) EULcalculations and (2) determining technical degradation factors (TDFs). EUL calculation method used phone or on-site interviews or both to determine if measures were actually installed and operating. For sites with changes, surveyors called back to get exact status of equipment. Results: Insufficient failures were documented to allow creating a credible ex post EUL for the measures. TDF calculation was restricted to one technology (HVAC) -- it has TDFs that are greater than one, resulring in a negative decrease savings versus standard units. Conclusion: the	1994
323R1	323.01	PG&E	Pacific Gas & Electric Company PY94 Nonresidential New Construction Retention Study	1-Mar-99	This study evaluated the retention of electric energy (kWh) and demand (kW) savings from the 1994 and 1996 nonres new construction programs. It developed estimates of effective useful life and technical degradation factors for savings from the combined PY94/96 programs. Methodology involved "effective useful life analysis", "technical degradation factor analyses" for the 24 technologies. the absence of any kWh failures among surveyed sites made estimation of any statistical models impossible. As a result, the ex ante EUL estimate of 16 years was retained as the ex post estimate. EUL for the "whole building" was 16 years, agreeing with ex ante estimate.	1994

ID	Num	Utility	Title	Publ	Summary	Prog Yr
324R1	324.00	PG&E	Fourth Year Retention Study for Pacific Gas & Electric Company's 1995 Commercial Energy Efficiency Incentives Programs: Lighting and	1-Mar-99	See Report 326R1	
325R1	325.00	PG&E	1994 - 1995 Industrial Energy Efficiency Incentive Programs: Third - Year Retention Study: Indoor Lighting End Use (1995)	1-Mar-99	Incorporates Studies # 311R1, 328R1, and 314R1. This study measures the effective useful life (EUL) of indoror lighting and process measures for which rebates were paid through PGE's 1994-5 industrial EEI programs. General method is to collect measure retention data from samples of participants, and fit parametric survival function to them. Survival function gives probability of surviving to any positive time 't'. Parameters of the function are estimated from retention data. Once the survival function parametrs are estimated, median lifetime or EUL is determined as the time 't*' such that the survival probability is equal to 50 percent. All study data were collected via on-site surveys. Results showed three of the process measures had no failures and so no results calculated for them. The '251-400W HID' lighting measures's ex post estimate is formally	1994-5
326R1	326.00	PG&E	Fourth Year Retention Study for Pacific Gas & Electric Company's 1995 Commercial Energy Efficiency Incentives Programs: Lighting and HVAC Technologies	1-Mar-99	Contains Study 324R1: Lighting. This study measures the effective useful life for all HVAC and Lighitn energy efficiency tech. for which PGE paid rebates in 1995 under its Com EEI Programs. Retrofits were performed under 3 PG&E programs: Retrofit Express, Retrofit Efficiency Options, and customize Incentives Programs. Approach was to compile summary statistics on raw retention data, visually inspect the retention data, devlop a trend line from the survival plots, and develop a survival function using classical survival techniques. Results showed the realization rate mated the EUL for the claim (at least for the 5 years since the devices were installed and until the	1995
328R1	328.10	PG&E	1994 - 1995 Industrial Energy Efficiency Incentive Programs: Third - Year Retention Study: Process	1-Mar-99	See Study 325R1 which incorporates this study.	
329R1	329.00	PG&E	Retention Study of Pacific Gas and Electric Company's 1994 and 1995 Energy Efficiency Incentives Program, Agricultural Sector	1-Mar-99	See Study 331R1 which incorporates this study.	
331R1	331.00	PG&E	Retention Study of Pacific Gas and Electric Company's 1994 and 1995 Energy Efficiency Incentives Program, Agricultural Sector Measures	1-Mar-99	Incorporates Studies #315R1, 321R1, 329R1. This study dicuments the level of measure retention in the third year after installation and estimates the ex post effective useful life (EUL) for PGE 1994 and 1995 Ag energy efficiency incentives (AEEI) programs. Measures include pump retrofit, greenhouse heat curtain, ag pumps other, and high intensity discharge lighting measures. Surveys were analyzed using 3 basic approaches to estimating EULs. These were the standard ordinary lest squares, a classic survival analysis, and the assumed funcitonal form approach. The only measure with ex post EULs were "pump retrofit" which had ex ante EULl of 9.0 and ex post eul of 9.1 (for	
332R1	332.00	SDGE, PGE	Final Report: Measure Retention Study -- 1994 & 1995 Residential Weatherization Programs (RWRP)	1-Mar-99	See Study # 957 which incorporates this study.	
338	338.00	PG&E	1995 Commercial Retrofit 4th Year Retention Study (All Measures)	1-Mar-99	Error? Study not identified.	
339	339.00	PG&E	1995 Industrial Retrofit 4th Year Retention Study (All Measures)	1-Mar-99	Error? Study not identified.	
340	340.00	PG&E	1995 Agricultural Retrofit 4th Year Retention Study (All Measures)	1-Mar-99	Error? Study not identified.	
341	341.00	PG&E	1995 Residential Direct Assis. Retrofit 4th Year Retention Study	1-Mar-99		
342	342.00	PG&E	1995 Residential EMS Retrofit 4th Year Retention Study	1-Mar-99	Error? Study not identified.	
384CR1	384.00	PG&E	Retention Study of Pacific Gas and Electric Company's 1994 and 1995 Residential Appliance Efficiency Incentives Program: 1994 Space Cond. Fourth Year Retention	1-Mar-99	Incorporates Studies 384BR1, 401BR1, and 384AR1 This study measures the effective useful life (EUL) of lighting, space conditioning and refrig. measures for which rebates were paid through PGE 1994-5 residential appliance efficiency incentives program. Method for the study collected measure retention data from a sample of participants, and fit a parametric survival function to those data. Survival function gives the probability of surviving to any positive time 't'. These parameters of the function are estimated from the retention data. Once the survival function parameters are estimated, median lifetime or EUL is determined as the time 't*' such that the survival probability is 50%. For lighting measures, retention data were collected via onsite inspectons for a sample. For cenral A/C and refrig. studied, retention data were gathered via phone surveys. A supplemental 'new recruend' sample provided info on measure loss due to customer'	1994-95
399R1	399.00	PG&E	Measure Retention Study of 1994 Power Savings Partners Program: Commercial Sector	1-Mar-99	This study evaluated the measure retention from commercial lighting technology for which rebates were paid in 1994 by PGE's power saving partners program. The PSP contract specifies that participants must submit results of monitoring data for each site. This dat is used to revise saings estimates and coreesponding payments annually and is included in this report. For the retention study, representatives of PGE performed annual inspections for each customer type of all projects implemented in 1994. The ratio of the corrected wattage to the total wattage originally claimed was used to calculate effective useful life (EUL) factors. Results showed the EUL for PY94	
401BR1	401.00	PG&E	Retention Study of Pacific Gas and Electric Company's 1994 and 1995 Residential Appliance Efficiency Incentives Program:1995 Lighting	1-Mar-99	See study 384CR1 which incorporates this study.	
525	525.00	SCE	1994\95 Residential 4th Year Retention Study	1-Mar-99		
525	525.00	SCE	1994\95 Residential 4th Year Retention Study	1-Mar-99		
529C	529.00	SCE	Southern California Edison 1993-1994 Commercial/ Industrial/ Agricultural energy Efficiency Incentives Program Fourth Year Retention Study	1-Mar-99	Studies retention of measures instlled by customers of SCE in 1993 and 1994 under the CIA EEI program. Commercial measures include: electronic ballasts, CFBs, T8 Lamps, Delamping/ Reflectors, HVAC EMS systems, High-Efficiency Chiller System, Adj. Speed Drives. Industrial and Ag sector measures include: Adj. speed drives, pumps, pump system hardware improvements, ballasts, T8 lamps, Lighting EMS, injection molding, process cooling, insulation on process equipment, air compressors, high efficiency chillers for process. Data was collected thourgh a lingitudinal survey effort over 4 years via on-site visits and phone surveys.Retention (after 4 years) was over 90 percent for all commercial measures except T8 lamps (67%) and CF lamps (75%). Retention (after 4 years) was over 90 percent for all ag. and industrial measures except T8 lamps	1993--94
529D	529.00	SCE	1994 Commercial CFL [Compact Fluorescent Lights] Manufacturers' Rebate Persistence Study	1-Mar-99	This research performs a measure retention study for SCE's 1994 Commercial CFL Manufacturers' Rebate Program. The evaluation estimates expected useful lives (EUL) for fixtures covered in the program and compares them to exante EuL estimates filed earlier. Blub EULs are also estimated. A follow-up inspection sample was used to determine retention with inspectors looking for tags applied in the first year evaluationl. Statistical models were used to extrapolate the retention retes to the time when half the units will remain. Much uncertainty is discovered regarding the EUL findings relating to fixtures, due to the short period of the study. Bulb EUls are estimated to be 2.8 years and forecasts are not particularly sensitive to model specification; prior	
529	529.00	SCE	1994\95 Non-Residential 4th Year Retention Study	1-Mar-99		
529A	529.00	SCE	Southern California Edison 1993-1994 Commercial/ Industrial/ Agricultural energy Efficiency Incentives Program Fourth Year	1-Mar-99	See Study #529C which incorporates this study.	
529B	529.00	SCE	Southern California Edison 1993-1994 Commercial/ Industrial/ Agricultural energy Efficiency Incentives Program Fourth Year	1-Mar-99	See Study #529C which incorporates this study.	
530	530.00	SCE	SCE Non-Residential New Construction Persistence Study: Final Report	1-Mar-99	See Study #554 which incorporates this study.	
535	535.00	SCE	1994\95 Residential Lighting 6th Year Retention Study	1-Mar-99		
552	552.00	SCE	1996\97 Residential DSM Bidding 4th Year Retention Study	1-Mar-99		
553	553.00	SCE	1996\97 Non-Residential 4th Year Retention Study	1-Mar-99		
554	554.00	SCE	SCE Non-Residential New Construction Persistence Study: Final Report	1-Mar-99	Estimates the persistence of savings and retention of measures installed in new construction and large remodeling applications for the two year 1994 and 1996. conducted at the whole building level. Used a combination of telephone and on-site surveys to est. survival proportion of the savings and estimate EUL of 11 installed measures. Found persistence of savings high for first few years but too soon to determine how long savings will last; statistical method of the present	

ID	Num	Utility	Title	Publ	Summary	Prog Yr
716	716.00	SCGas	1994 Residential New Construction Fourth-Year Retention Evaluation (Energy Advantage Home Program)	1-Mar-99	This study assesses and verifyies useful lifetimes of various measures installed through SCGas 1994 Energy Advantage Home Program. Elevan DSM measures and 2 fuel substitution mesures were reviewed. The approach consisted of: assessment to primary and secondary data sources; on-site survey, and statistical analysis (summary statistics, life table method, and parametric models). Retention fractions for the measures was nearly 1. Ex ante EULs and the retention study EULs were identical except for gas ovens (20 for ex ante and 18 for the retention study EUL). Determined that the sample in this study was relatively small and did not necessarily provide	1994
957	957.00	SDGE	Final Report: Measure Retention Study -- 1994 & 1995 Residential Weatherization Programs (RWRI)	1-Mar-99	Incorporates Study #332R1. This is the measure retention study for the 1994/5 residential weatherization retrofit incentives programs operated by SDGE and PGE. Measures include attic and ceiling insulation (SDGE and PGE), infiltration (SDGE) wall insulations (PGE), floor insulation (PGE). The sampling plan was designed to ensure representation across study measures for each utility. Two hundred fifty site visits were conducted by auditors. Findings were that the	
958	958.00	SDGE	1995 Residential DSM Bidding - 2nd Persistance Study	1-Mar-99		
960	960.00	SDGE	1994 & 1995 Commercial Energy Efficiency Incentives: Fourth Year Retention Evaluation	1-Mar-99	Contains study # 924 also. Ten measures were studied. Lighting and HVAC end uses were covered. The econometric framework is similar to Study #933 Results were that the EULs were usually the same ex ante and ex post	
961	961.00	SDGE	1995 Commercial Multiple Enduses - 2nd Persistance Study	1-Mar-99		
963	963.00	SDGE	1994 & 1995 Industrial Energy Efficiency Incentives: Fourth Year Retention Evaluation	1-Mar-99	Fourth year retention evaluation for 1994-5 industrial energy efficiency incentives (process and lighting measures). Data was from surveys and the method was same as Study 933 (qv). Eighteen measures were evaluated. Ex post EULs were same as ex ante except for exist sign kit (LED)	
964	964.00	SDGE	1995 Industrial Multiple Enduses - 2nd Persistance Study	1-Mar-99		
966	966.00	SDGE	1994 & 1995 Agricultural Energy Efficiency Incentives: Fourth Year Retention Evaluation	1-Mar-99	Fourth year retention evaluation for 1994-5 agricultural EEI Data was from one customer survey and the method was same as Study 933 (qv).One measure (variable frequency drive on a trickling filter pump motor) was evaluated. Ex post EUL was same as ex ante	
967	967.00	SDGE	1995 Agricultural Multiple Enduses - 2nd Persistance Study	1-Mar-99		
972	972.00	SDGE	1994 & 1995 Nonresidential New Construction Program: Fourth Year Retention Evaluation	1-Mar-99	Fourth year retention evaluation for 1994-5 nonres. new const. program. The program was called Savings through Design. It was a rebate program and the info on the participant was used to create a sample for this study. Econometric methodology is described in Study 933. Results showed	
975	975.00	CADMAC	Final Report: Statewide Study of the Retention of Measures Installed Under the Direct Assistance Program (DAP)	1-Mar-99	Incorporates Study #341R, #571, and #713. Retention of effects of 6 primary measures offered in the 1994, 1995 and 1996 residential direct assistance programs operated by SCE, PG&E, SDGE and SCGas. Site surveys were used to determine installation and operation. Results for "percent overall retention" were: evap. coolers =100; evap. cooler covers = 70; attic / ceiling insulation = 97; low flow showerhead = 86; door weather stripping = 94; caulking = 52; water heater blankets	
976	976.00	SDGE	1995 Residential Direct Assistance - 2nd Persistance Study	1-Mar-99		
978	978.00	SDGE	1995 Residential All Enduses - 1st Persistance Study	1-Mar-99		
979	979.00	SDGE	1995 Residential All Enduses - 2nd Persistance Study	1-Mar-99		
361	361.00	PG&E	1996 Commercial Retrofit 4th Year Retention Study (All Measures)	2-Mar-99	Error? Study not identified.	
362	362.00	PG&E	1996 Industrial Retrofit 4th Year Retention Study (All Measures)	2-Mar-99	Error? Study not identified.	
363	363.00	PG&E	1996 Agricultural Retrofit 4th Year Retention Study (All Measures)	2-Mar-99	Error? Study not identified.	
364	364.00	PG&E	1996 Commercial EMS 4th Year Retention Study	2-Mar-99	Error? Study not identified.	
365	365.00	PG&E	1996 Industrial EMS 4th Year Retention Study	2-Mar-99	Error? Study not identified.	
366	366.00	PG&E	1996 Agricultural EMS 4th Year Retention Study	2-Mar-99	Error? Study not identified.	
707	707.00	SCGas	SCG's 1995 Non-Residential New Construction 4th Year Retention Study	2-Mar-99		
982	982.00	SDGE	1996 Refrig\Freez Engineering\Statewide - 2nd Persistance Study	2-Mar-99		
985	985.00	SDGE	1996 Lighting Engineering\Statewide 2nd Persistance Study	2-Mar-99		1996
988	988.00	SDGE	1996 Residential Miscellaneous - 2nd Persistance Study	2-Mar-99		1996
991	991.00	SDGE	1996 Residential DSM Bidding - 2nd Persistance Study	2-Mar-99		
994	994.00	SDGE	1996 Commercial Multiple Enduses - 2nd Persistance Study	2-Mar-99		
997	997.00	SDGE	1996 Industrial Multiple Enduses - 2nd Persistance Study	2-Mar-99		
1000	1000.00	SDGE	1996 Agricultural Multiple Enduses - 2nd Persistance Study	2-Mar-99		
1003	1003.00	SDGE	1996 Res New Construct Multiple Enduses - 2st Persistance Study	2-Mar-99		
1006	1006.00	SDGE	1996 Nonresidential New Construction - 2nd Persistance Study	2-Mar-99		
1009	1009.00	SDGE	1996 Commercial Multiple Enduses - 2nd Persistance Study	2-Mar-99		
1012	1012.00	SDGE	1996 Industrial Multiple Enduses - 2nd Persistance Study	2-Mar-99		
1015	1015.00	SDGE	1996 Agricultural Multiple Enduses - 1st Persistance Study	2-Mar-99		
344	344.00	PG&E	1995 Industrial Retrofit 6th Year Retention Study (All Measures)	3-Mar-99	Error? Study not identified.	
345	345.00	PG&E	1995 Agricultural Retrofit 64th Year Retention Study (All Measures)	3-Mar-99	Error? Study not identified.	
347	347.00	PG&E	1995 Residential EMS Retrofit 6th Year Retention Study	3-Mar-99	Error? Study not identified.	
556	556.00	SCE	1996\97 Residential Lighting 6th Year Retention Study	3-Mar-99		
368	368.00	PG&E	1996 Industrial Retrifot 6th Year Retention Study (All Measures)	4-Mar-99	Error? Study not identified.	
369	369.00	PG&E	1996 Agricultural Retrifot 6th Year Retention Study (All Measures)	4-Mar-99	Error? Study not identified.	
546	546.00	SCE	1994\95 Residential 9th Year Retention Study	4-Mar-99		
547	547.00	SCE	1994\95 Non-Residential 9th Year Retention Study	4-Mar-99		
548	548.00	SCE	1994\95 Non-Residential New Construction 9th Year Retention Study	4-Mar-99		
343	343.00	PG&E	1995 Commercial Retrofit 9th Year Retention Study (All Measures)	6-Mar-99	Error? Study not identified.	
346	346.00	PG&E	1995 Residential Direct Assis. Retrofit 9th Year Retention Study	6-Mar-99	Error? Study not identified.	
557	557.00	SCE	1996\97 Residential DSM Bidding 9th Year Retention Study	6-Mar-99		
558	558.00	SCE	1996\97 Non-Residential 9th Year Retention Study	6-Mar-99		
559	559.00	SCE	1996\97 Non-Residential New Construction 9th Year Retention Study	6-Mar-99		
367	367.00	PG&E	1996 Commercial Retrofit 9th Year Retention Study (All Measures)	7-Mar-99	Error? Study not identified.	
370	370.00	PG&E	1996 Residential Direct Assistance 9th Year Retention Study	7-Mar-99	Error? Study not identified.	
706	706.00	SCGas	SCG's 1995 Non-Residential New Construction 9th Year Retention Study	7-Mar-99		
718	718.00	SCGas	1995 Commercial New Construction Program: Fourth Year Retention Study	1-Feb-00	This retention survey primarily addressed cooking equipment in commercial kitchens installed under the SCGas 1995 Commercial New Construction Program. The measures were: oven, fryer, range, griddle, broiler, packaged HVAC Systems, steamer, hot food table, kettle, braising pan, other cooking, storage hot water, and boiler. Over 150 onsite inspections were made. Percentage of measures retained after 5 years were highest for braising pans (100%) and lowest for kettles and	1995

ID	Num	Utility	Title	Publ	Summary	Prog Yr
406cR1	406.30	PG&E	1995 Residential Appliance Efficiency Incentives Program: Sapce Confitioning Fourth Year Retention Table 6b	1-Mar-00	Contains Protocol Table 6.b; results of retention study for 1995 residential space conditioning 4th year retention. For completed analysis see related studies: 384bR1, 384cR1 and 384aR1.	1995
551	551.00	SCE	1996\97 Residential Lighting 3rd Year Retention Study	1-Mar-00		
916	916.00	SDGE	1994 Refrigeration Engineering\Statewide - 2nd Persistance Study	1-Mar-00		
922	922.00	SDGE	1994 Lighting Engineering\Statewide 2nd Persistance Study	1-Mar-00		
925	925.00	SDGE	1994 Commercial Multiple Enduses - 2nd Persistance Study	1-Mar-00		
928	928.00	SDGE	1994 Industrial Multiple Enduses - 2nd Persistance Study	1-Mar-00		
931	931.00	SDGE	1994 Agricultural Multiple Enduses - 2nd Persistance Study	1-Mar-00		
934	934.00	SDGE	1994 Res New Construction Multiple Enduses - 2nd Persistance Study	1-Mar-00		
937	937.00	SDGE	1994 Nonresidential New Construction - 2nd Persistance Study	1-Mar-00		
940	940.00	SDGE	1994 Commercial Multiple Enduses - 2nd Persistance Study	1-Mar-00		
943	943.00	SDGE	1994 Industrial Multiple Enduses - 2nd Persistance Study	1-Mar-00		
946	946.00	SDGE	1994 Agricultural Multiple Enduses - 2nd Persistance Study	1-Mar-00		
981	981.00	SDGE	1996 Refrig\Freez Engineering\Statewide - 1st Persistance Study	1-Mar-00		
984	984.00	SDGE	1996 Lighting Engineering\Statewide 1st Persistance Study	1-Mar-00		1996
987	987.00	SDGE	1996 Residential Miscellaneous - 1st Persistance Study	1-Mar-00		1996
990	990.00	SDGE	1996 Residential DSM Bidding - 1st Persistance Study	1-Mar-00		
993	993.00	SDGE	1996 Commercial Multiple Enduses - 1st Persistance Study	1-Mar-00		
996	996.00	SDGE	1996 Industrial Multiple Enduses - 1st Persistance Study	1-Mar-00		
999	999.00	SDGE	1996 Agricultural Multiple Enduses - 1st Persistance Study	1-Mar-00		
1002	1002.00	SDGE	1996 Res New Construct Multiple Enduses - 1st Persistance Study	1-Mar-00		
1005	1005.00	SDGE	1996 Nonresidential New Construction - 1st Persistance Study	1-Mar-00		
1008	1008.00	SDGE	1996 Commercial Multiple Enduses - 1st Persistance Study	1-Mar-00		
1011	1011.00	SDGE	1996 Industrial Multiple Enduses - 1st Persistance Study	1-Mar-00		
1014	1014.00	SDGE	1996 Agricultural Multiple Enduses - 1st Persistance Study	1-Mar-00		
534	534.00	SCE	1994\95 Non-Residential DSM Bidding 1st Persistence Study			
549	549.00	SCE	1994\95 Non-Residential DSM Bidding 2nd Persistence Study			
555	555.00	SCE	1996\97 Non-Residential DSM Bidding 1st Persistence Study			
560	560.00	SCE	1996\97 Non-Residential DSM Bidding 2nd Persistence Study			

Table 2: Nonresidential Measures
Effective Useful Life Values for Major Energy Efficiency Measures

End Use	#	Measure	PG&E	SCE	SDG&E	SoCalGas	Proposed EUL
COOKING	5	COOKING EQUIPMENT - EFFICIENT				X	12.0
ENGINE	13	ENGINE - HIGH EFFICIENCY				X	15.0
LIGHTING	14	BALLAST - DIMMABLE	X	X			16.0
LIGHTING	15	BALLAST - ELECTRONIC	X	X			16.0
LIGHTING	34	CF SCREW-IN REPLACEABLE LAMP (MODULAR)	X	X	X		7.7
LIGHTING	40	COMPACT FLUORESCENT HARDWIRE FIXTURE	X	X	X		16.0
LIGHTING	41	DELAMPING / FIXTURE MODIFICATION / REMOVE LAMPS	X		X		16.0
LIGHTING	42	EXIT SIGN - CF HARDWIRE KIT / LED / ELECTRO-LUMINESCENT	X	X	X		16.0
LIGHTING	45	FLUORESCENT FIXTURE - T8	X	X			16.0
LIGHTING	48	HALOGEN LAMP	X				0.6
LIGHTING	51	HID FIXTURE	X	X	X		16.0
LIGHTING	60	OCCUPANCY SENSOR	X	X	X		8.0
LIGHTING	62	PHOTOCELL	X	X		X	8.0
LIGHTING	66	T8 FIXTURES - 17-WATT LAMP, 2 FT.	X				16.0
LIGHTING	71	T8 FIXTURES - 32-WATT LAMP, 4 FT.	X				16.0
LIGHTING	75	TIMECLOCK - LIGHTING	X				8.0
LIGHTING	212	FIXTURE: T-8 LAMP & ELEC BLST, (FEM or NEW FIXTURE), 3 FT FIXT	X				16.0
LIGHTING	214	HIGH EFFICIENCY LIGHTING	X				16.0
LIGHTING	216	HIGH OUTPUT T-5 FIXTURE	X				16.0
LIGHTING	218	INDUCTION LAMPS	X				1.7
LIGHTING	219	INDUCTION FIXTURE	X				16.0
LIGHTING	230	INDOOR SYSTEM MODIFICATION		X			16.0
LIGHTING	231	LIGHTING CONTROLS		X			16.0
LIGHTING	232	OUTDOOR SYSTEM MODIFICATION		X			16.0
LIGHTING	266	LIGHTING - SPC			X		16.0
LIGHTING	278	DAYLIGHTING CONTROLS	X	X		X	16.0
LIGHTING (NON-RE	190	LIGHTING POWER DENSITY		X		X	13.0
MISCELLANEOUS	77	KILN / OVEN / FURNACE				X	25.0
MISCELLANEOUS	78	KILN / OVEN / FURNACE - HEAT RECOVERY				X	25.0
MISCELLANEOUS	80	THERMAL NIGHT CURTAINS	X				5.0
MISCELLANEOUS	226	CUSTOMIZED - SPC		X			15.0
MISCELLANEOUS	235	LOCAL GOVERNMENT INITIATIVES		X			11.4
MISCELLANEOUS	242	EXTRUSION EQUIPMENT		X			15.0
MISCELLANEOUS	245	INJECTION MOLDING EQUIPMENT		X			15.0
MISCELLANEOUS	247	MISC EQUIPMENT		X			15.0
MISCELLANEOUS	248	AUDITS				X	3.0
MISCELLANEOUS	251	PLUG LOAD SENSOR		X			10.0
MISCELLANEOUS	255	INFORMATION				X	1.0
MISCELLANEOUS	267	OTHER - SPC			X		10.0
MOTORS	83	MOTORS - HIGH EFFICIENCY	X	X	X		15.0
MOTORS	236	VFD		X	X		15.0
PROCESS	259	PROCESS OVERHAUL				X	25.0
PUMPING	239	PUMP TEST		X			15.0
PUMPING	243	SYSTEM CONTROLS		X			15.0
REFRIGERATION	93	AUTO CLOSER FOR COOLER / FREEZER	X	X			8.0
REFRIGERATION	97	DOOR GASKETS	X	X	X		4.0
REFRIGERATION	100	FLOATING HEAD PRESSURE	X				16.0
REFRIGERATION	101	HEATLESS DOOR	X	X			16.0
REFRIGERATION	102	HUMIDISTAT CONTROL FOR ANTI-SWEAT	X	X			12.0
REFRIGERATION	103	INSULATION ON REFRIGERATION SUCTION LINE	X	X			11.0
REFRIGERATION	105	NIGHT COVERS FOR DISPLAY CASES	X	X			5.0
REFRIGERATION	106	PSC EVAPORATOR MOTOR - WALK-IN / DISPLAY	X				16.0
REFRIGERATION	107	REFRIGERATION CASE DOORS - GLASS/ACRYLIC, LOW/MEDIUM TEMP	X	X			12.0
REFRIGERATION	108	REFRIGERATOR CASE WITH DOORS, LOW/MEDIUM TEMP	X	X			16.0

Table 2: Nonresidential Measures
Effective Useful Life Values for Major Energy Efficiency Measures

End Use	#	Measure	PG&E	SCE	SDG&E	SoCalGas	Proposed EUL
REFRIGERATION	109	REFRIGERATOR CONDENSATE EVAPORATOR - ELECTRIC / NON-ELECTRIC	X				8.0
REFRIGERATION	111	STRIP CURTAINS FOR WALK-INS	X	X			4.0
REFRIGERATION	206	BALLAST: ELECTRONIC, FOR DISPLAY CASE	X	X			16.0
REFRIGERATION	208	DEFROST	X				16.0
REFRIGERATION	211	FHP & EFF COND	X				16.0
REFRIGERATION	215	HIGH EFFICIENCY LIQUID SUCTION HEAT EXCHANGERS	X				16.0
REFRIGERATION	220	NIGHT SHIELDS ON REFRIGERATOR AND FREEZER CASES	X				16.0
REFRIGERATION	224	REFRIG: EVAPORATOR FAN CONTROLLER	X				5.0
REFRIGERATION	246	SUPERMARKET SYSTEMS		X			14.0
SPACE CONDITION	116	AIR-CONDITIONERS - HIGH EFFICIENCY	X	X	X		15.0
SPACE CONDITION	118	BOILER - HIGH EFFICIENCY	X			X	20.0
SPACE CONDITION	121	BYPASS / DELAY TIMER - HVAC	X				15.0
SPACE CONDITION	122	CHILLER - HIGH EFFICIENCY		X			20.0
SPACE CONDITION	124	CHILLER - VSD	X				20.0
SPACE CONDITION	126	COOLING TOWERS / EVAP CONDENSER		X			15.0
SPACE CONDITION	135	FURNACE - HIGH EFFICIENCY	X			X	25.0
SPACE CONDITION	136	GLAZING - HIGH VLT AND HIGH SHADE COEFFICIENT	X				24.0
SPACE CONDITION	138	HEAT PUMP - PACKAGED	X				15.0
SPACE CONDITION	139	HVAC / SPACE HEATING / EFFICIENT DESIGN				X	15.0
SPACE CONDITION	141	INSULATION	X				20.0
SPACE CONDITION	147	REFLECTIVE WINDOW FILM / WINDOW	X	X	X		10.0
SPACE CONDITION	148	SET-BACK THERMOSTAT	X	X	X		11.0
SPACE CONDITION	150	TIMECLOCK - HVAC	X	X			10.0
SPACE CONDITION	201	HEAT PUMP - SPLIT SYSTEM	X				15.0
SPACE CONDITION	202	A/C PACKAGED TERMINAL UNITS	X	X			15.0
SPACE CONDITION	204	ADJUSTABLE SPEED DRIVE	X	X			15.0
SPACE CONDITION	213	GROUND SOURCE HP	X				15.0
SPACE CONDITION	217	HP WITH INTEGRATED WATER HEATING	X				15.0
SPACE CONDITION	222	PACKAGED HVAC SYSTEMS	X	X			15.0
SPACE CONDITION	225	WATER COOLED CHILLERS	X				20.0
SPACE CONDITION	227	INSULATION PACKAGE	X				20.0
SPACE CONDITION	229	ENERGY MANAGEMENT SYSTEM		X			15.0
SPACE CONDITION	233	REDUCE INTERNAL LOAD		X			15.0
SPACE CONDITION	240	EVAPORATIVE COOLERS		X			15.0
SPACE CONDITION	241	ENERGY REDUCTION		X			10.0
SPACE CONDITION	265	HVAC / REFRIGERATION - SPC			X		20.0
SPACE CONDITION	272	NONRESIDENTIAL GAS A/C				X	20.0
WATER HEATING	153	WATER HEATER - EFFICIENT GAS				X	15.0
WATER HEATING	263	HORIZONTAL WASHER			X		10.0
WATER HEATING	264	EFFICIENT DISHWASHING			X		5.0
WATER HEATING	274	WATER HEATER CONTROLS				X	15.0
WHOLE BUILDING	209	DOMESTIC HOT WATER BOILER (GAS)	X				24.0
WHOLE BUILDING	221	WHOLE BUILDING (NRNC)	X		X		16.0
WHOLE BUILDING	273	ENERGY EDGE				X	10.0

Table 3: Residential Measures
Effective Useful Life Values for Major Energy Efficiency Measures

End Use	#	Measure	PG&E	SCE	SDG&E	SoCalGas	Proposed EUL
LIGHTING	158	CF SCREW-IN DISPOSABLE (INTEGRAL)		6	9		See Values
LIGHTING	160	CF HARDWIRE FIXTURE (MODULAR)	X	X			20.0
LIGHTING	244	INDOOR FIXTURES		X	X		20.0
LIGHTING	249	OUTDOOR FIXTURES		X	X		20.0
LIGHTING	260	TORCHIERE			X		9.4
LIGHTING	262	FLUORESCENT FIXTURES			X		17.0
LIGHTING	269	LIGHTING - RCP			X		16.0
MISCELLANEOUS	234	WHOLE HOUSE		X		X	19.0
MISCELLANEOUS	252	ENERGY USAGE PROFILE AUDIT		X			1.0
MISCELLANEOUS	254	LOCAL GOVERNMENT INITIATIVES		X			38.6
MISCELLANEOUS	270	OTHER - RCP			X		10.0
MISCELLANEOUS	275	AUDITS		X		X	2.0
MISCELLANEOUS	276	INFORMATION				X	1.0
REFRIGERATION	161	REFRIGERATOR - HIGH EFFICIENCY	X	X	X		15.0
REFRIGERATION	253	SPARE REFRIGERATOR RECYCLING		X			6.0
SPACE CONDITIONINC	162	AIR CONDITIONERS - CENTRAL HIGH EFFICIENCY	X	X	X		18.0
SPACE CONDITIONINC	163	EVAPORATIVE COOLER	X				7.0
SPACE CONDITIONINC	169	GLAZING - LOW E DOUBLE / LOW SHADE COEFFICIENT		X	X		25.0
SPACE CONDITIONINC	170	HEAT PUMP - ELECTRIC	X		X		18.0
SPACE CONDITIONINC	173	INSULATION FOR CEILING / FLOOR	X	X			25.0
SPACE CONDITIONINC	175	INSULATION FOR WALLS	X	X	X		25.0
SPACE CONDITIONINC	203	A/C WITH INTEGRATED WATER HEATING	X				15.0
SPACE CONDITIONINC	205	ADVANCED HVAC TUNE UP	X				18.0
SPACE CONDITIONINC	207	BASIC HVAC DIAGNOSTIC TUNE UP	X	X	X		10.0
SPACE CONDITIONINC	210	DUCT TEST (AND SEAL)	X				25.0
SPACE CONDITIONINC	223	PROGRAMABLE THERMOSTAT	X		X		12.0
SPACE CONDITIONINC	228	INSULATION PACKAGE	X	X			25.0
SPACE CONDITIONINC	238	DUCT TESTING (AND SEALING)		X	X	X	25.0
SPACE CONDITIONINC	250	ROOM A/C		X	X		15.0
SPACE CONDITIONINC	261	ADVANCED HVAC DIAGNOSTIC TUNE UP			X		15.0
SPACE CONDITIONINC	268	HVAC / REFRIGERATION - RCP			X		20.0
SPACE CONDITIONINC	271	RESIDENTIAL GAS A/C				X	25.0
WASHER	181	CLOTHES WASHER - HORIZONTAL AXIS		X	X	X	14.0
WASHER	237	DISHWASHER		X	X		13.0
WATER HEATING	183	INSULATION FOR PIPE	X		X		15.0
WATER HEATING	184	SHOWERHEAD - ENERGY EFFICIENT	X		X		10.0
WATER HEATING	187	WATER HEATER - EFFICIENT GAS	X		X	X	13.0
WATER HEATING	277	WATER HEATER CONTROLS				X	15.0

Added information pertaining to Appendix H
METERING AND MONITORING PROTOCOLS

Discussions with NAESCO in July of 2002 stated that most of their members use the International Performance Monitoring & Verification Protocol (MVP) standards to perform metering and monitoring. There are no NAESCO protocols specific to metering or monitoring. If the MVP protocols are of interest, the reader should go to the website at http://www.ipmvp.org/ipmvp_det.html.

APPENDIX I
MEASURE COST STUDY

The Protocols state that this document is bound under separate cover. As of August, 2002, this document is available from the California Energy Commission's Publications office. Interested parties can contact this office at:

Publications
California Energy Commission
1516 Ninth Street, MS-13
Sacramento, CA 95814
Phone: 916-654-5200

The 1996 Measure Cost Study is referenced as P300-97-002 and is available at a nominal cost ($12).

Additionally, portions of the measure cost study has been updated by the 2001 DEER Update Study, August 2001. This study is available at www.calmac.org. A search on the database for the keyword "DEER" will pull up this document electronically.

Added information pertaining to Appendix Z
AUTHORIZED EXEMPTIONS AND ALTERNATIVES TO ADOPTED MEASUREMENT PROTOCOLS

July 2002: During the effort to compile a complete set of Protocol appendices in electronic format, the original meaning of the text in Appendix Z was discussed with industry members that were present when the Protocols were drafted. It seemed to be consensus that Appendix Z was intended to define the process for modification of the Protocols through the use of prospective waivers, and was not intended as a receptacle for documentation of each Protocol deviation. Deviations to the Protocols that occurred over time (there was only one occurrence of a prospective waiver) were handled through the submission of waivers, the review of those waivers by CADMAC, and where appropriate incorporation of the changes into the Protocols. Thus, the most current version of the Protocols, with its appendices, incorporates all approved changes to Protocol methodology and approach. Appendix B discusses both prospective and retrospective waivers further.