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Handout re. multifamily/dwelling type distributions among low income households.

1. Background:

Utility Applications and use of ACS. In recent budget applications, at least three of four IOU's used American Community Survey (ACS)-based distributions, in their recent budget applications, to provide base year estimates of proportion of ESAP-eligible households by combinations of

- tenure (ownership/rentership, hereafter *"ownership")* and

- dwelling type: single family including attached, duplex through quadplex, vs. multifamily 5+ units, vs. mobile home.

Note re. connection to annual estimate work. These ACS estimates are secondary to, and not particularly dependent upon, our effort which produces annually updated CARE, FERA, ESAP, and other household-by-income related estimates by various utility, census, and jurisdictional geographies.

- High level description of the main annual estimation process is provided in Appendix B to this handout.

CHPC's Concern. The budget application estimates are substantially different, for some utilities, from estimates in the KEMA/ED Low Income Needs Assessment (LINA), Ch. 4,

- based upon the small 2003 HENS survey of 1,534 households supporting the LINA.

- Effectively, CHPC has added more evidence regarding the issue of bias in the LINA, most glaringly evident in respect to known population demographic and housing data.

2. Supplementary to this handout:

Appendix A: EEGA Data Request 1593. Copy of SCE's response to the ED data request – description of simple method used, comparison to 2007 LINA.

Appendix B: high level description of annual estimates. This is ancillary to the current issue regarding American Community Survey (Census) vs. KEMA/ED estimates based on HENS 2003. A high level description is included as an appendix to this handout.

Documentation for annual estimates. We provide, annually, estimates by small and large area re. program eligibility, and a detailed report on methodology, issues regarding data sources, etc. The report is available upon request, and the report will probably become available on CALMAC in the near future. The next report will be complete in early January.

3.   The KEMA/ED estimates in LINA Chapter 4.

HENS. Developed from a small sample all-IOU of 1,534 low income households, in 2004. The following comments are more developed in the response to ED in Appendix A, and in comments provided to KEMA and its subcontractor during the study.

Guideline changes' modest role. LIEE/CARE maximum income guideline 175% of FPL (federal poverty limit) – this more restricted target population could very slightly influence percentage multifamily/renter relative to current nominal guideline of 200%, which translates to roughly 216% of FPL for two person households and 292% for single person households).

HENS development as described in LINA:

Sampling plan. Geographically stratified (zip), multi-stage cluster sample with CARE and non-CARE quotas within small areas. Limited documentation of actual results.

Lack of "control" to known population distributions. No use of <u>known</u> small or large area distributional information – e.g. on ownership or dwelling type(!) to either guide the sampling process or provide ex post weighting adjustments, after sampling and unevaluated sample selection bias had occurred.

Small (final sample size 1,534). Even absent biases due to recruitment from areas with high concentrations of low income households (correlated with both multifamily and rentership), sampling error itself is fairly large for any given utility.

Possible processing difficulties. We replicated tables from LINA Chapter 4 in order to provide whole utility estimates. Some question about whether the reporting categories in Chapter 4 (PG&E, SCE only, SCG only SCG/SCE, and SDG&E) properly mesh with the reported sample dispositions in LINA Table 3.6 – substantial discrepancies involving SCE and SCG.

Per utility reporting in the tables cited by CHPC: **no whole-utility reporting for either SCE or SCG.** CHPC cites results for the small portions of the sample that are either SCE-only areas or SCG-only areas. This accounts for some but not all of the "stark contrast" with utility application data.

LINA tables 4-22 and 4-23 (home ownership and dwelling type, with whole SCE and whole SCE added). Taken from SCE response to Data Request 1593.

	All Calif (RASS)	All Low Income	PG&E	SCE only	SCE/SCG overlap	SCG only	SDG&E	Overall SCE	Overall SCG
TABLE 1: Re-estimate of Needs Assessment Tables 4-22 and 4-23 including HENS SCE total/SCG total weighted estimates*									
Own	63	35	44	28	35	21	32	32.28	28.08
Rent (indiv)	36	62	53	68	64	72	65	65.90	68.03
Rent (mm)	1	3	3	4	0	7	7	1.82	3.89
TOTAL	100	100	100	100	99	100	104	100.00	100.00
Single Fam	64	43	55	21	52	28	38	38.02	39.89
Multi-fam 2-4	8	7	10	6	6	4	6	6.24	5.00
Multi-fam 5+	23	43	28	54	41	66	50	47.12	54.85
Mobile home	6	6	6	18	1	0	6	8.63	0.27
	101	99	99	99	100	98	100	100.00	100.00

- Previously Table 04 of EEGA DR 1593 response.

CHPC's ex parte communication of August 12 cited SCE-only and SCG-only column (yellow highlight) and ignored the estimates pertaining to common areas; we have estimated overall SCE and SCG percentages (green highlight) from the HENS data set after replicating these and several other Chapter 4 tables (accepting KEMA's case weights and utility-designator variable from the final HENS file).

4. IOU method relying upon American Community Survey.

More detail available in Appendix.

ACS, briefly. Oversimplifying, ACS is essentially a replacement for the decennial Census' long form. Since 2005,

- roughly 125,000 households are surveyed annually on a variety of topics,

- including housing, demographic, and socioeconomic items.

- The data files released annually are the product of surveys taking place in the previous year.

- Respondent households are identifiable geographically only by "PUMA" (233 PUMAS in California, with significant boundary redrawing to be completed in 2012).

ACS as used by utilities for application. Utilities used results from the following process, conducted for another purpose in 2008. Over sample households in the 2006 ACS data set, identify households that would have been at 200% FPL per Energy Division guidelines of that year, and households with total income exceeding those guidelines.

- Tabulate, for the entire state, and by utility territory, and by above/below 200%FPL, the distribution of a variable consisting of unique combinations of owner/renter and dwelling type. Utility specific estimates are weighted, effectively, by the product of the ACS household weight and the share of the household's PUMA that is within the utility boundary (based on geocoded residential service data).

- Eliminating a handful of "other" tenure arrangements (neither ownership nor rentership), and "other" dwelling types (not single family, multi-family, or mobile home buildings), estimate the unique proportions.

Example for SCE, 2006 vs. 2009. The following table, taken from SCE's response to EEGA DR 1593's, provides the distribution on household ownership by dwelling type for the SCE territory's lower income households, including, for completeness, the small percentages of "OTHER" dwelling or tenure types. The response included a more simply estimated California – wide table as well, but we focus here on the SCE table, which, among other features, is quite consistent between the 2006 exercise (used by the utilities due to press of time) and the 2009 version of the same exercise, conducted to validate the 2006 estimates' robustness.

TABLE 2: ACS 2006 vs. ACS 2009 Household Ownership & Dwelling Type percentage distribution for low income households, SCE Territory *			
Household Ownership & Dwelling Type	**SCE < 200% FPL, 2006**	**SCE < 200% FPL, 2009**	**DIFF**
1:OWN__1:MOBL	6.21	5.76	-0.45
1:OWN__2:SF	31.64	32.93	1.29
1:OWN__3:2-4 U	0.86	0.78	-0.08
1:OWN__4:5-49 U	1.13	0.99	-0.14
1:OWN__4:50+ U	0.34	0.42	0.08
1:OWN__5:OTHER	0.18	0.11	-0.07
2:RENT_1:MOBL	1.9	2.09	0.19
2:RENT_2:SF	18.94	19.78	0.84
2:RENT_3:2-4 U	10.05	9.58	-0.47
2:RENT_4:5-49 U	18.53	18.06	-0.47

2:RENT_4:50+ U	7.83	7.04	-0.79
2:RENT_5:OTHER	0.07	0.11	0.04
3:OTHR_1:MOBL	0.22	0.16	-0.06
3:OTHR_2:SF	1.5	1.78	0.28
3:OTHR_3:2-4 U	0.17	0.12	-0.05
3:OTHR_4:5-49 U	0.32	0.25	-0.07
3:OTHR_4:50+ U	0.08	0.05	-0.03
3:OTHR_5:OTHER	0.02	0.00	-0.02
TOTAL-->	100.00	100.00	

- Previously Table 02B of EEGA DR 1593 response.

Percentages implied for each utility's application. As a matter of process, SCE, SCG, and SDG&E used the 2006 distribution in identical fashion last spring, to produce a base distribution on ESAP-eligible utility households as of December 31, 2010. We made a spreadsheet available to SDG&E and PG&E as well. Including each utility, but limiting presentation for SDG&E to the more geographically inclusive electric service and PG&E to its "EG" or electric and gas households only (as provided to PG&E), the following are estimates of proportion renter and proportion multifamily, per utility. For comparison, we provide the best estimate derivable from Tables 4-22 and Table 4-23 of the LINA, including SCG and SCE "overall."

Table 3: Summary Table: Rentership and Multifamily (5+) percentages per ACS and per KEMA/LINA.

	SDGE	SCG(ALL)	SCE(ALL)	PGE(EG)
Rentership				
ACS (utilities)	65.18	65.14	58.75	62.60
HENS 04 (KEMA)	73	72	68	56
Multifamily (5+)				
ACS (utilities)	41.22	36.53	28.55	30.45
HENS 04 (KEMA)	50	55	47	28
95% C.I. (+/-) , SCE				
Rentership				
ACS (utilities)			0.75	
HENS 04 (KEMA)			3.95	
Multifamily (5+)				
ACS (utilities)			0.78	
HENS 04 (KEMA)			4.22	

With the notable exception of PGE(EG), the IOU's ACS rentership estimates and multifamily estimates trail those generated by the LINA sampling and data collection process. As evidenced in the SCE column, the rentership and multifamily estimates from HENS 04 have confidence intervals that do not come close to enclosing the reliable population estimates from the ACS. This is indicative of bias in the sampling and data collection process that has not been corrected for known and available Census distributions - if the problem were sampling error alone, these very significant gaps would not occur.

***Appendix A: EEGA Data Request 1593.* Copy of SCE's response to the ED data request – description of simple method used, comparison to 2007 LINA.**

1) In developing your IOU's recent ESAP budget application projections, what methodology was used to determine the number of ESAP eligible households by housing type (as reported in Attachment A-4)?

   Response:

   SCE's approach to the housing type/ownership issue involved use of American Community Survey (ACS) Census data, weighted to reflect the presence of each IOU's served households in the 233 sub-state geographical areas – Public Use Microdata Areas or "PUMAs," from which the 2006 ACS sample had been drawn. The ACS is an annual, comprehensive survey covering socioeconomic, demographic, and housing for individuals and households, and replaces the decennial Census "long form." In recent years, the ACS sample has reached about one percent of California households distributed fairly evenly across the 233 PUMAs. To develop the data for Attachment A-4, the 2006 ACS sample of about 125,000 household survey records was allocated to utility territory using small area IOU data reflecting the presence of the utility in each of the PUMAs while incorporating the Census household weights. For each IOU, and statewide, a tabulation characterizing the population of households was produced, crossing …

   - household federal poverty limit (FPL) status (above or below the CARE/LIEE 200% FPL guideline),
   - ownership (rent vs. own vs. other)
   - dwelling type (single family, multifamily 2-4 units, multifamily 5+ units, mobile home, and other).

   The work using the 2006 ACS data was originally done in order to satisfy a broad request from the IOUs for detailed "secondary variable" distributions for households above and below 200% FPL. Due to time constraints, SCE and other IOUs used the 2006 ACS data to prepare Attachment A-4. In responding to the current data request, SCE analyzed the 2009 ACS data using more current utility household data small area distributions to weight it and determined that the results would be quite similar to the filed Attachment A-4 results based on 2006 ACS data. For example, the 2009 ACS data produces a multifamily household estimate of 27.2% vs. the 28.6% produced through the 2006 ACS data for SCE.

   As part of the original effort, tabulations over ACS 2006 relied upon 2006 CARE/LIEE guidelines to establish above/below 200% FPL status for survey records; recodes were performed to characterize households on various variables, including Household Ownership & Dwelling Type – a composite indicating the household's ownership (own, rent, other) and simplified dwelling type (mobile home, single family, 2-4 unit multifamily, 5-49 unit multifamily, 50+ unit

multifamily, and other). For California as a whole, and for each of the IOUs by fuel type, distributions were provided on households above and below 200% FPL.

Table 1 provides ACS 2006 percentage distribution results for above / below household income guidelines categories, statewide and for SCE. Note, for example, that among low income households, mobile home ownership appears to be slightly more prevalent in SCE territory than statewide (6.21 vs. 4.98 percent). More pronounced differences involve owned single family homes, and rented dwellings in moderate sized (5-49 unit) multifamily locations. SCE used the distributions (with "OTHER" categories eliminated from the distribution as "noise" with dubious likelihood of residential utility service) to develop Attachment A-4. The resulting percentage distributions were applied to base year (December 31, 2010) estimated ESAP eligibility counts, and to projected planning figures for ESAP eligibility (2011 through 2014). The distributions also were applied to projected treated homes in 2011 through 2014. Actual program data was used to enter the treated homes in 2010 in Attachment A-4.

TABLE 01: ACS 2006 Household Ownership & Dwelling Type percentage distribution by above/below guideline, California/SCE

Household Ownership & Dwelling Type	CALIF >=200% FPL	CALIF < 200% FPL	SCE >= 200% FPL	SCE < 200% FPL
1:OWN__1:MOBL	2.53	4.98	3.03	6.21
1:OWN__2:SF	60.91	27.98	64.18	31.64
1:OWN__3:2-4 U	1.25	0.83	1.07	0.86
1:OWN__4:5-49 U	1.65	0.94	1.63	1.13
1:OWN__4:50+ U	0.63	0.38	0.51	0.34
1:OWN__5:OTHER	0.09	0.20	0.09	0.18
2:RENT_1:MOBL	0.43	1.63	0.48	1.90
2:RENT_2:SF	10.98	17.81	10.66	18.94
2:RENT_3:2-4 U	5.35	10.86	4.70	10.05
2:RENT_4:5-49 U	10.80	22.05	9.06	18.53
2:RENT_4:50+ U	4.35	9.73	3.68	7.83
2:RENT_5:OTHER	0.02	0.09	0.02	0.07
3:OTHR_1:MOBL	0.07	0.26	0.07	0.22
3:OTHR_2:SF	0.68	1.60	0.61	1.50
3:OTHR_3:2-4 U	0.08	0.20	0.07	0.17
3:OTHR_4:5-49 U	0.13	0.34	0.10	0.32
3:OTHR_4:50+ U	0.06	0.10	0.05	0.08
3:OTHR_5:OTHER	0.00	0.02	0.00	0.02
TOTAL-->	100.00	100.00	100.00	100.00

Table 2A responds to the question of stability of estimates between ACS 2006 and now-available ACS 2009, for the statewide estimates (including all parts of all PUMAs, whether in IOU territory or not) of the Household Ownership & Dwelling Type distribution for low income households, as defined by the Energy Division guidelines of the year in question. Results appear to be fairly stable across the two years' samples.

TABLE 02A: ACS 2006 vs. ACS 2009 Household Ownership & Dwelling Type percentage distribution for low income households, California			
Household Ownership & Dwelling Type	**CALIF < 200% FPL, 2006**	**CALIF < 200% FPL, 2009**	**DIFF**
1:OWN__1:MOBL	4.98	4.51	-0.47
1:OWN__2:SF	27.98	28.81	0.83
1:OWN__3:2-4 U	0.83	0.75	-0.08
1:OWN__4:5-49 U	0.94	0.94	0.00
1:OWN__4:50+ U	0.38	0.43	0.05
1:OWN__5:OTHER	0.20	0.13	-0.07
2:RENT_1:MOBL	1.63	1.64	0.01
2:RENT_2:SF	17.81	19.02	1.21
2:RENT_3:2-4 U	10.86	10.50	-0.36
2:RENT_4:5-49 U	22.05	22.08	0.03
2:RENT_4:50+ U	9.73	8.68	-1.05
2:RENT_5:OTHER	0.09	0.11	0.02
3:OTHR_1:MOBL	0.26	0.22	-0.04
3:OTHR_2:SF	1.60	1.67	0.07
3:OTHR_3:2-4 U	0.20	0.14	-0.06
3:OTHR_4:5-49 U	0.34	0.27	-0.07
3:OTHR_4:50+ U	0.10	0.11	0.01
3:OTHR_5:OTHER	0.02	0.01	-0.01
TOTAL-->	100.00	100.00	

Table 2B examines the stability of estimates for the ACS approach where PUMA level estimates are weighted to reflect presence of SCE households in each PUMA. Again, results are fairly stable, with the emerging increase in owned and rented single family dwellings mirroring the statewide results.

TABLE 02B: ACS 2006 vs. ACS 2009 Household Ownership & Dwelling Type percentage distribution for low income households, SCE Territory			
Household Ownership & Dwelling Type	**SCE < 200% FPL, 2006**	**SCE < 200% FPL, 2009**	**DIFF**
1:OWN__1:MOBL	6.21	5.76	-0.45
1:OWN__2:SF	31.64	32.93	1.29
1:OWN__3:2-4 U	0.86	0.78	-0.08
1:OWN__4:5-49 U	1.13	0.99	-0.14
1:OWN__4:50+ U	0.34	0.42	0.08
1:OWN__5:OTHER	0.18	0.11	-0.07
2:RENT_1:MOBL	1.9	2.09	0.19
2:RENT_2:SF	18.94	19.78	0.84
2:RENT_3:2-4 U	10.05	9.58	-0.47
2:RENT_4:5-49 U	18.53	18.06	-0.47
2:RENT_4:50+ U	7.83	7.04	-0.79
2:RENT_5:OTHER	0.07	0.11	0.04
3:OTHR_1:MOBL	0.22	0.16	-0.06
3:OTHR_2:SF	1.5	1.78	0.28
3:OTHR_3:2-4 U	0.17	0.12	-0.05
3:OTHR_4:5-49 U	0.32	0.25	-0.07
3:OTHR_4:50+ U	0.08	0.05	-0.03
3:OTHR_5:OTHER	0.02	0.00	-0.02
TOTAL-->	100.00	100.00	

2) How does your IOU's methodology as outlined in question 1 compare to the methodologies utilized in the 2003 RASS and 2004 HENS studies referred to in the 2007 KEMA Final Report on Phase 2 Low Income Needs Assessment? Please refer specifically to Section 4.5 (Page 4-7) and Table 4-23 of Section 4.6.2 (Page 4-28) of the KEMA report.

Response:

The IOU methodology relied on sources of information for housing type/ownership data that are better estimated with Census and/or Census-based American Community Survey (ACS) data sources as described below. In this response SCE compares the IOU's methodology as outlined in the response to Question 1 to the methodologies utilized in the 2003 Residential Appliance Saturation Survey (RASS) and 2004 HENS/ KEMA Low Income Needs Assessment Study.

The HENS/Needs Assessment distributions were developed in 2004 when the LIEE and CARE maximum income was set at 175% of the federal poverty limit (FPL). The HENS data relied upon a geographically stratified, multi-stage cluster sampling process that produced a small (n=1,534) sample of respondents, statewide. There are a number of factors as described in this response that may have led to this small sample being biased towards producing population percentage estimates that are high for multi-family housing (and therefore renter households) compared to the unbiased IOU Census-based methodology. Not enough is reported in the Needs Assessment to allow a full understanding and analysis of the HENS sample design and its execution. Despite this, there are enough problems encountered when comparing the HENS and Census-based results, to be cause for concern, as will be seen below.

The FPL used in the HENS study produces a small, one percent discrepancy on rentership and multifamily dwelling between the HENS and the Census-based IOU data given the changes in guidelines since 2004. In 2004, seniors and customers with disabilities were eligible for LIEE services at up to 200% of the FPL. The Commission raised the guidelines for both LIEE and CARE programs uniformly to 200% in October 2005 (D.05-10-044). SCE's approach in developing Attachment A-4 adhered to the income guidelines as approved by Energy Division. The CARE and ESA guidelines currently applied by the Commission extend income eligibility to 292% of FPL for single-person households and 216% for two-person households (see SCE Advice 173-G/2585-E). SCE believes it is reasonable to assume excluding the upper tier of CARE and LIEE eligible participants in HENS may result in a slightly greater proportion of renters and multifamily dwellings in the HENS distribution. However, SCE believes there are other more significant factors that account for the difference in the Census-based IOU and the HENS results.

SCE believes that there are consequential flaws in developing the HENS sample, including a failure to properly integrate Census data in the HENS sample development. Within the Needs Assessment, the design for the HENS sample, at least as executed, did not take into account Census distributions on key variables (other than ZIP Code Tabulation Area [ZCTA] level percent of households at 150% poverty as an aspect of zip code level cluster sampling), as bases for either controlled sample stratification, or weighting the obtained sample to better reflect key distributions that are well estimated by Census sources. In fact, SCE believes that 2003 RASS data, which was relied on for some of the descriptive tables in the Needs Assessment would have been superior to the HENS sample in describing low income households since it is a larger sample with less apparent vulnerability to bias).

SCE also recognizes that there are several basic population and housing stock issues pertaining to CARE or ESAP that are better estimated with Census or Census-based data sources. This is the case, despite the added value of some of the unique information gathered in the HENS survey effort. Furthermore, the descriptive estimates built from those specific, HENS-unique data would have also been less likely biased, if Census sources had played a greater role in either sample design, weighting, or both. SCE posits that the small sample size, and unclear effects of the Needs Assessment sample design, as well as sample non-response reinforce the importance of utilizing Census sources as either alternatives or sampling/weighting correctives. Moreover, the discussion regarding references to ethnic and non-CARE low-income quotas, in Chapter 3 of the Needs Assessment does not adequately address concerns that the sample design or the execution yielded a bias toward multi-family/renter households.

There are symptomatic problems in HENS sample and reporting of the data. In the specific case of Tables 4-22 and 4-23 Section 4.6.2 at issue in the data request (on ownership status and dwelling type), as well as many other tables presented in Chapter 4, the Needs Assessment used RASS 2003 data for describing the entire households statewide. Note that the RASS 2003 sample is approximately 22,000 households, covering the IOU, SMUD and LADWP service territories and not the entire statewide households. On the other hand, the HENS 1,534 records were used for the purpose of all-IOU and IOU-specific estimates pertaining to low-income households

The *per- utility* reporting in Tables 4-22 and 4-23 is specific to sampled zip codes and their relationship to utility geographies and their overlap: i.e, "SCE" and "SCG" columns refer to the non-overlapping portions of the two utilities territories. SCE conducted independent analyses of the HENS data set after verifying over a number of Chapter 4 tables that KEMA's categorical variable "ldc" was used as the basis for utility column definitions in that Chapter. Further review reveals major inconsistencies with respect to planned and obtained samples, as well as how data are reported by utility in Chapter 4. This is revealed in comparing of Table 3-5 (final sample allocation), Table 3-6 (final sample

disposition), and the sample counts involved according to "ldc" in Chapter 4. As illustrated in Table 3 below, these differences are especially pronounced for SCE and SoCal Gas counts. These significant inconsistencies, which make it unclear what transpired between sample planning, data collection, and reporting, are additionally suggestive of unreliability in Chapter 4 estimates.

TABLE 03: Needs Assessment Final Sample Allocation, Sample Disposition, and Chapter 4 Reporting Counts.			
	Table 3.5 Allocation	**Table 3.6 Final Disposition**	**Chapter 4 Reporting**
PG&E	456	462	460
SCE	40	***160***	***213***
SCE/SCG	586	***489***	***327***
SCG	296	***294***	***405***
SDGE	122	130	129
Total	1,500	1,535	1,534

Using "ldc" utility designator variable, SCE added HENS-weighted estimates for *overall* SCE and SCG to the Needs Assessment tables, as follows in Table 04:

TABLE 04: Re-estimate of Percentages in Needs Assessment Tables 4-22 and 4-23 including HENS SCE total/SCG total weighted estimates								
	All Calif (RASS)	**All Low Income**	**PG&E**	**SCE only**	**SCE/SCG overlap**	**SCG only**	**SDG&E**	**Overall SCE**	**Overall SCG**
Own	63	35	44	28	35	21	32	32.28	28.08
Rent (indiv)	36	62	53	68	64	72	65	65.90	68.03
Rent (mm)	1	3	3	4	0	7	7	1.82	3.89
TOTAL	100	100	100	100	99	100	104	100.00	100.00
Single Fam	64	43	55	21	52	28	38	38.02	39.89
Multi-fam 2-4	8	7	10	6	6	4	6	6.24	5.00
Multi-fam 5+	23	43	28	54	41	66	50	47.12	54.85
Mobile home	6	6	6	18	1	0	6	8.63	0.27
	101	99	99	99	100	98	100	100.00	100.00

HENS 2004/Needs Assessment rentership estimates are reduced but remain slightly high (relative to Census population estimates) in the overall (SCE and SCG) estimates in the shaded columns; multi-family 5+ percentages also fall but remain too high. The vast majority of SCE's customers also receive service from SoCalGas. SCE notes that CHPC has used data in the "SCE only" column to claim SCE's 54% of eligible households reside in multifamily dwelling with 5 or more units. In any case, the estimates in Table 04 are only fleshing out HENS

data to provide whole utility estimates, and still do not reflect weighting to account for known distributions from the U.S Census.

Table 5 provides a direct comparison on the basic questions of rentership and multi-family (5+ units), limited to SCE and statewide data. The comparison is between HENS 2004 and ACS 2006-based estimates, with the latter adjusted, as was done by SCE in its Application, to eliminate "Other" ownership and "Other" dwelling types from the estimate base. SCE includes in Table 05 the 95% confidence intervals estimated from the replicate weights provided by the U.S. Census to illustrate the much greater precision of the ACS. Linking HENS and ACS estimates with these confidence intervals also reveals that for SCE, ACS estimates are substantially outside the HENS confidence intervals -- evidence that *bias,* rather than simple sampling error associated with the small HENS sample, is a substantial problem.

TABLE 05: Comparison on rentership and multifamily percentage: statewide and SCE-specific.				
	HENS RENTER	**ACS06 RENTER**	**HENS MULTIFAM5+**	**ACS06 MULTFAM5+**
STATE-WIDE		63.87		34.05
HENS-SW	65.00		43.10	
SCE	67.72	58.75	47.12	28.55
SCE 95% CONF. INT (+/-)	3.95	0.75	4.22	0.78

Appendix B: High Level Description of Annual Estimates of CARE, FERA, and ESAP Eligibility.

[summarized from documentation for 2010 estimates: Athens Research Eligibility Estimates Documentation 12-23-10.doc – sections B and C. Many steps and processes omitted, including sensitivity tests and validation exercises]

Main elements of standard approach

- Fit American Community Survey (2005-2009) co-distributions of CPI updated household income, household size, householder age to small area <u>block group</u> data marginal distributions for 2010 (obtained from vendor designated by Energy Division).

- Within the resulting block group specific estimated cross tabulation, compare CARE, ESAP, FERA and other income/household size related guidelines to the cell definitions, to compute overall block group eligibilities.

- Using GIS-processed utility residential service data in part, disaggregate/aggregate eligibility and other parameters relating to households to provide internally consistent estimates for areas defined by state, utility, Census, postal, jurisdictional, CEC climate zone, and CEC forecast zone geographies: for example levels of aggregation are county/zip+2, block group, whole utility, utility/county, or statewide.

- Eligibility estimates are used by the IOUs throughout subsequent year as factors modifying their served household counts to produce quarterly total eligible households.

- We provide follow up estimates by small and large area that include eligibilities by payer type (individually metered, master metered, sub metered), and for households above and below 200%FPL, distributions on secondary variables like dwelling type, ownership, ethnicity, linguistic isolation, etc.

Key data sources in the standard approach include ..

- The Energy Division program guidelines, HHS definitions of poverty, etc.

- IOU residential service data (individually metered, submetered, master metered) which is geocoded for use in various weighting and aggregation/disaggregation exercises.

- American Community Survey 2005-2010 and Decennial Census

- Applied Geographic Solutions and STI/Popstat current year block group marginal distributions on household income, household size, and householder age.

- California full year current year CPI from Department of Finance

- Sammamish zip+4 centroid files (mapping to zip+4 to Census block)

- Shape files from CEC delineating climate and forecasting zones

- Block and block group shape files from Census

- 2000-2010 correspondence tables linking Census geographies between decennial Census products.

- OSEDA/Missouri Census Data Center extracts allowing Census correspondence table development.

Labor force adjustment effort.

- In the only effort that we know of to provide small area adjustments to current year household income distributions …

- We model one year labor force transitions occurring in various regions of California, between full time, part time, part time/slack work, unemployment, and discouraged worker status, by demographic, industrial, and occupational status. These transitions, are used to adjust current year block group household marginal to reflect changes that have occurred in the past year, updating the one year old distributions provided by the demographic vendor.

Key data sources in this auxiliary, but now expected, process are

- Monthly Current Population Survey data ("CPS Monthly," U.S. Census)
- Public Use MicroData Sample data for 2005-2009 American Community Survey ("ACS/PUMS," U.S. Census)
- Integrated Public Use MicroData Series ("IPUMS-CPS," Minnesota Population Center, University of Minnesota)
- Labor Market Information Data ("EDD/LMID,:" California Employment Development Department).
- Additional vendor data sources, including projected small area unemployment data from STI/Popstats (Synergos Technologies, Inc.)