

DOCKET

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California Energy Commission
Dockets Office, MS-4
Re: Docket No. 12-IEP-1D
1516 Ninth Street
Sacramento, CA 95814-5512

Re: Public Comment, Docket No. 12-IEP-1D

During the testimony provided to the Commissioners of the California Energy Commission by Dr. William Glassley, Commissioner Weisenmiller requested that additional information be provided regarding the summary of energy savings shown in the presentation about geothermal heat pumps. Specifically, discussion centered around the annual energy use for each of California's sixteen climate zones.

Shown in Table 1 are the computed annual energy use values for conventional HVAC technology, produced by ESim (a standard load modeling tool) load model calculations. The totals are the values plotted in the accompanying figure (Figure 1).

Table 1. Modeled heating and cooling annual energy use (equivalent kWh), by climate zone.

	Climate Zone	Cooling kWh	Heating kWh	Total Yearly kWh
Arcata	1	101	17438	17539
Santa Rosa	2	1222	13453	14675
Oakland	3	684	9144	9828
Sunnyvale	4	1128	9086	10214
Santa Maria	5	724	10492	11216
Los Angeles	6	1299	2989	4288
San Diego	7	1208	2843	4051
El Toro	8	1611	3048	4659
Pasadena	9	2470	5129	7599
Riverside	10	2450	6243	8693
Red Bluff	11	3101	12866	15967
Sacramento	12	2456	12251	14707
Fresno	13	3513	10258	13771
China Lake	14	4438	11723	16161
El Centro	15	6982	3165	10147
Mt. Shasta	16	3025	12485	15510

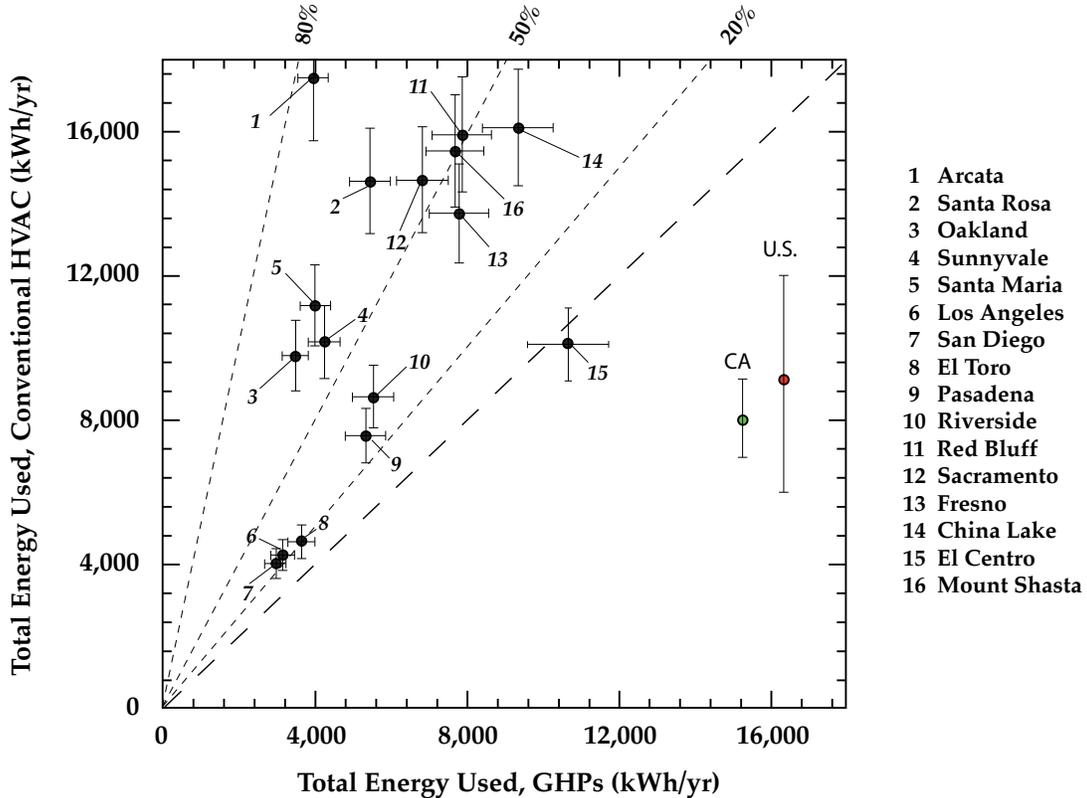
Shown in Table 2 are the annual energy use values for HVAC purposes for California's three largest Investor Owned Utilities, based on data in the California Energy

Commission website (Energy Almanac). The average for these data are plotted in Figure 1 as “CA”. For comparison purposes, the average value and range for the United States is also shown in Figure 1 (based on U.S. DOE Energy Information Agency data).

Table 2. Heating and cooling annual household energy use, as deduced from data reported by California’s three largest utilities.

Utility	Annual kWh
PG&E	8957
SCE	8180
SDG&E	7127

It should be noted that the data are not directly comparable, in that the models assumed a fixed size residence and occupancy for all climate zones. These assumed values do not directly correspond to the average residence in the individual utility regions. Nevertheless, the average of all values in the modeled data are fully consistent with the data reported by the utilities, in the sense that the areas covered by them show energy use for HVAC to be greater than that modeled. This was expected given the small dwelling size and low occupancy rate assumed in the load calculations. In essence the utility data provided demonstrates the conservative nature of this study. At the same time, those smaller regions for which large IOUs do not provide power and natural gas are also regions with the greatest heating demand and per capita energy consumption. For example, the per capita energy use in Del Norte County (climate zone 1) has a per capita energy use that is nearly twice that of Los Angeles County, of which a significantly greater proportion is used for heating purposes.



If there are further questions, please contact Dr. William Glassley at wglassley@ucdavis.edu.

Thank you for the opportunity to provide additional information.

Respectfully,

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