
SDCAN Evaluation of San Diego Gas and Electric Company's Supplemental Filing

**Prepared testimony of
Michael Shames**

**6975 Camino Amero
San Diego, CA 92111
619-393-2224**

**on behalf of
San Diego Consumers' Action Network
California Public Utilities Commission
Rulemaking 12-06-013**

February 28, 2014

**CALIFORNIA PUBLIC UTILITIES COMMISSION
RULEMAKING NO. 12-06-013
PREPARED TESTIMONY OF MICHAEL SHAMES
on behalf of
SAN DIEGO CONSUMERS' ACTION NETWORK**

I. Overview

This testimony is presented by Michael Shames, Director of San Diego Consumers' Action Network (SDCAN) on issues relating to the supplemental filing of San Diego Gas & Electric (SDG&E). He has appeared before this Commission on numerous occasions and has been recognized as an expert on matters relating to both telecommunications and energy. His qualifications are attached in Attachment "A".

This testimony is presented to summarize SDCAN's findings and recommendations and to address two important issues:

1. SDG&E's proposal constitutes rate shock for Tier 1 customers.
2. SDG&E's 20% tier differential target is inappropriate as it
unreasonably impairs incentives for conservation and energy
efficiency.
3. SDG&E's decision to include ERRA undercollections but not include
assumptions for an offset as a result of the SONGS investigation

serves to inappropriately inflate SDG&E's revenue and distort its proposed rate design.

In its revision, SDG&E has preserved its four pricing tiers for residential customers but has modified them as to unduly raise Tier 1 rates in its effort to narrow the tier differentials. In this testimony, SDCAN submits that residential customers are best served by a pricing scheme comprised of equally differentiated tiers to preserve the conservation benefits of tiered rates while permitting the top tier levels to be reduced. SDCAN's alternative rate design will continue to encourage customers who use a disproportionate amount of electricity -- generally large homes using significant amounts air conditioning and irrigation/water amenities -- to invest in consumption reduction efforts or to move to dynamic pricing plans. These are customers who impose greater costs upon the SDG&E system than customers with modest and predictable energy consumption and, correspondingly, will be more receptive to energy pricing incentives. SDCAN does not offer any testimony relating to CARE rates, as this issue is being fully addressed by other consumer intervenors.

II. Summary of SDG&E's Proposal

There are four essential elements of SDG&E's revised testimony:

- 1) It proposes that Tier 1 and Tier 2 rates would increase with SAR increases;

- 2) SDG&E proposes an additional increase to Tier 1 non-CARE rates of 1 cents/kWh, resulting in a Tier 1 increase of between 24.8%-27%;
- 3) Its proposed summer rate differentials are substantially unequal. Its proposed Summer residential kWh rate is 19.1¢ for Tier 1, 20.8¢ for Tier 2, 35.4¢ for Tier 3 and 36.4¢ for Tier 4.
- 4) SDG&E proposes to reduce the rate differential between Tier 3 and Tier 4 non-CARE rates from 2 cents/kWh to 1 cents/kWh.
- 5) Its rate design is driven by an objective of reducing the differential between the highest and lowest tiers to 20%.

The actual bill impacts represented in SDG&E's Revised Prepared Direct Testimony of Cynthia Fang appears to be inconsistent with the company's Supplemental Attachment C.1. (1,2, 5 and 6 of 16) which shows bill increases of between 25-27% for over 285,000 customers who use less than 350kWh. The number of customers experiencing over 20% increases is close to 500,000.

III. SDCAN's Recommendations

The Assigned Commissioner and ALJ's January 24, 2014 ruling, resolution of this proceeding's issues includes this question: "(a) is the rate change proposal consistent with AB 327?" SDCAN's response is: "no".

Section 739.9, as amended by AB 327 states, in part, that the Commission may adopt new, or expand existing, fixed charges for the purpose of collecting a

reasonable portion of the fixed costs of providing electric service to residential customers. The commission shall ensure that any approved charges do all of the following:

(1) Reasonably reflect an appropriate portion of the different costs of serving small and large customers.

(2) Not unreasonably impair incentives for conservation and energy efficiency.

SDG&E's proposal violates AB327 because it doesn't adequately reflect appropriate portion of the different costs of serving residential customers and it unreasonably impairs incentives for conservation and energy efficiency. As will be set forth below, SDCAN recommends the two following revisions:

1. The thrust of any rate changes should occur in Tiers 2&3, laying the foundation for a three-tiered rate structure to be implemented in 2015 or 2016. Tier 1 should experience no more than a SAR increase, at most.
2. SDG&E's revenues should be revised to either exclude the projected ERRRA rate increase or to incorporate offsetting decreases, such as those expected in I. 12-10-013.

A. Rate Shock for Tier 1 customers

The first basis of SDCAN's objection is that, if adopted, the majority of SDG&E's customers who keep their consumption within the first tier will experience rate increases of 24.8%.¹ Since 2001, these customers have not experienced an annual increase in excess of 6.34%. SDCAN submits that a Tier 1 rate increase in excess of 400% of this *historical high* constitutes rate shock and is, thus, at odds with the direction of the Assigned Commissioner's Ruling.

The numbers contained in SDG&E's February 11, 2014 Supplemental Bill Impact Tables are sobering. Over 460,000 customers are expected to experience 20% or higher increases compared to January 2014 rates if SDG&E's proposal is adopted.² The impacts are even greater if compared to November 2013 rates.³

SDCAN submits that in subsequent phases of this proceeding the Commission is expected to reduce SDG&E's rate design to three tiers. The differential between these tiers should be largely equal, thus offering some degree of conservation incentives and awards to customers who wisely use electricity or who have made energy efficiency/self-generation investments to reduce their

¹ Table CF-8, Testimony of Cynthia Fang, p. CF-26

² Supplemental Attachment C.1. Non-CARE Inland, Basic Service tables (5 of 16 and 6 of 16) and Non-CARE Coast, Basic Service, Summer (1 of 16 and 2 of 16)

³ Supplemental Attachment B

electric use. Thus, any rate design changes made in this proceeding should be done with an eye towards movement towards three equally differentiated tiers.

In response to SDCAN data requests, SDG&E has developed an equally differentiated three-tiered rate that incorporates an assumed SONGS revenue reduction of \$70 million.⁴ This rate design results in a three tiers separated by an approximate 6-7 cent differential.⁵ In the 2014 rate design adjustments authorized by the Commission, the differential between the current tier 1 and 2 should be widened, while the differential between tiers 3 and 4 should be reduced. SDG&E has proposed the latter, but has focused the tier 1 and 2 changes disproportionately upon tier 1 rather than tier 2.

In comparing SDG&E's Table CF-8 and Attachment B provided by SDG&E in response to SDCAN's First Set of Data Requests, Tier 1 should be increased to no more than 16 cents and Tier 2 should be raised from 17.8 to close to 22 cents per kwhr. Meanwhile, Tiers 3 and 4 and be brought closer to the 34 cent range.⁶ This is substantially different that SDG&E's proposed design of a Summer kWh rate of 19.1¢ for Tier 1, 20.8¢ for Tier 2, 35.4¢ for Tier 3 and 36.4¢ for Tier 4, as set forth in Table CF-8.

⁴ See excerpted data response in Attachment B

⁵ SDG&E's calculations showing unequal differentials for Schedule DR in summer and winter are not fully explained and will be subject to cross-examination in this proceeding.

⁶ Each of these adjustments are for summer rates only.

B. 20% Tier Differential Impact upon Conservation

SDCAN asserts that charging proportionately higher energy rates for higher usage customers is a key tool for sending conservation price signals. Reducing the differential between the highest and lowest tiers to a mere 20% would have significant implications upon energy conservation signals and the financial viability of solar distributed generation. Such changes are also at odds with the Assigned Commissioner's Ruling, AB327 and outweigh the potential negative policy implications.

SDCAN maintains that multi-tiered pricing at the higher usage levels increases conservation incentives for those customers with the opportunity for reducing the greatest amount of load. As has been established in numerous studies⁷, including one developed by JBS Energy by SDCAN, higher-usage customers tend to have higher incomes than customers with lower usage and that higher-usage customers typically have load patterns that are more peaked relative to the load patterns of customers with lower usage, and that their loads are concentrated more during the summer hours and during the hour of system coincident peak. As a result, higher-usage customers are likely to be more costly to the system on a per-kWh basis than are customers with lower usage.

⁷ See Attachments C-E

SDCAN's data suggest that SDG&E's proposal to substantially reduce the tier differentials between Tier 1 and Tier 4 and to significantly reduce price signals for higher-usage customers while also increasing lower tier rates would not just be backwards from the standpoint of conservation incentives, but would also be regressive and would remove price differentiation that appropriately reflects the cost differentiation between customers in these tiers.

In addition, SDCAN notes that "smart" technologies will provide the opportunity for tiered pricing to work more effectively. SDG&E's recent deployment of smart meters creates the opportunity for customers (and third-party energy management companies) to use real-time data to access marginal tiered prices. This information will allow customers to make more informed decisions about their consumption levels and patterns. To abandon tiered pricing precisely when new technologies will be allowing customers to better utilize this pricing scheme would be counterproductive.

Energy management decisions that reduce consumption of grid power are all the more important in the context of the state's greenhouse gas reduction goals. Substantially raising lower tiers and eliminating the differential between tiers does not promote California's energy efficiency and greenhouse gas reduction goals. On the contrary, it weakens incentives for consumer energy management behaviors that the Commission is seeking to promote.

A final consideration is that IOUs have just recently installed Smart Meter infrastructure to provide consumers with additional tools to understand their energy usage and to reduce usage in response to price signals. Changing price signals at this time would therefore be particularly unfortunate and could reduce the benefits from the Smart Meter investment. It could also interfere with studies of the effectiveness of these meters for residential customers, since a proposed structural change to residential rates (i.e., the change from volumetric-only rates to a fixed charge plus volumetric rates) would weaken incentives to respond to the price signals provided by the Smart Meters.

C. SAN ONOFRE

SDG&E's proposed rate structure fails to incorporate any revenue requirement reductions expected from the premature retirement of the San Onofre Nuclear Generating Station (SONGS). These reductions include disallowances of replacement power costs for the extended SONGS outage in 2012, disallowances for unreasonable O&M and capital spending in 2012, eliminating any rate of return on retired assets, and disallowing recovery of some or all steam generator costs.⁸ In so doing, SDG&E ignores the SDG&E/ SCE

⁸These issues are being addressed in three phases of I. 12-10-013,

proposal to redirect \$214 million from the SONGS nuclear decommissioning trust fund to cover base O&M costs at SONGS that are currently included in SCE's 2013 and 2014 revenue requirements.⁹ And it ignores a proposed decision by the assigned ALJ in Phase 1 that would compel a refund of approximately \$20 million to SDG&E customers for reduced operating costs, alone and a pending Phase 2 proposed decision expected to further reduce the utility's revenues.

SDG&E's methodology, which relies upon full SONGS revenue requirements for capital and O&M, despite the fact that the Commission is also considering much more significant reductions, serves to unduly inflate SDG&E's revenue requirements. Because the Commission is expected to act on Phase 1 and 2 of I. 12-10-013 in the first quarter of 2014, the proposed rate design should be either revised to ignore any and all 2014 rate adjustments (ERRA, SONGS etc), or should be revised to reflect the actual and expected reductions associated with I. 12-10-013.

⁹ SCE Advice Letter 2968-E

ATTACHMENT A

QUALIFICATIONS OF MICHAEL SHAMES

Michael Shames has an extensive background in utility-related matters and regulation. Mr. Shames was the co-founder of Utility Consumers' Action Network and since June 2012 has served as SDCAN's Director. A 1978 graduate of UCLA, Mr. Shames received his Bachelor of Arts in Public Administration and went on to receive a Juris Doctorate in 1982 from the University of San Diego School of Law. During his studies at the University of San Diego, Mr. Shames developed the model for UCAN. From the outset, UCAN was designed to represent residential and small business consumers in the highly technical areas of utility rate regulation.

During his 27-year tenure as UCAN Executive Director, Mr. Shames has participated in numerous regulatory proceedings before the PUC. In addition to all SDG&E general rate cases since 1986 and most major statewide electric utility proceedings, Mr. Shames has played a major role in telecommunications issues before the PUC. He has prepared expert testimony in the MCI-Sprint merger case, the Pacific Bell Marketing Case and the Cingular Investigation of 2003. He also has provided expert testimony in each of SDG&E's last five rate cases, in SDG&E's Advanced Meter Initiative proceeding and, most recently, SDG&E's Sunrise Transmission application. Since 2007, he has served on SDG&E's Technical Advisory Panel for AMI deployment. Prior to that, he also served on SDG&E's Technical Advisory Panel for Energy Efficiency program implementation. And Mr. Shames has been appointed to numerous oversight panels by the Public Utilities Commission during his 21-year career. In 1997, Mr. Shames was appointed by the California Public Utilities Commission to serve on two advisory boards: The California Board for Energy Efficiency and the Consumer Education Advisory Panel. And the California Senate appointed Mr. Shames to serve on the Joint Task Force on Privacy Reform.

In addition to his work before the PUC, Mr. Shames has also participated in several regulatory hearings on behalf of UCAN before the California Department of Insurance. He presented expert testimony in each of SDG&E's General Rate Cases since 1987, and most recently in A. 10-12-005.

Mr. Shames has repeatedly appeared before the California Energy Commission and California Legislative Oversight Committee on Energy and Public Utilities as a recognized consumer representative. He has spoken on assorted utility consumer issues at the National Association of State Utility Consumer Advocates (NASUCA) and the National Association of Regulatory Utility Commissioners (NARUC) conferences as well as a number of other conferences. He has testified in hearings before the Public Utilities Commission on cellular and electric regulation cases. And he was selected to serve on the Advisory Board of the Competition Policy Institute based in Washington DC. In addition to his work for UCAN, Mr. Shames has served as an adjunct professor at University of San Diego, School of Business, where he taught between 1991 and 1995. His articles on utility issues have been published in most of the state's major newspapers and scholastic journals, including the Energy Law Journal on California's Electric deregulation in summer 2003. He has published articles in Public Utilities Reports, Harvard Business Review and has contributed chapters to two books on deregulation. [Preserving Consumer Protection and Education in a Deregulated Electric Services Industry., Who Benefits From Privatization, Hossain & Malbon, Eds. (Routledge, 1998) and "Consumer Principles for Electric Utility Reform", in Electric Utilities Moving into the 21st Century, Enholm & Malko, eds. PUR Inc. (1994)

ATTACHMENT B

SDG&E Response to SDCAN Data Request 14

14. Please provide a revised Attachment B – Schedule DR (summer and winter) that contains two changes from the residential customer assumptions underlying your proposed unbundled rates:
 - a. For Schedule DR, instead of two tiers, Attachment B should contain three tiers that are whose rates are differentiated proportionately, i.e. the % delta between each tier should be equal. Tier 1 should begin at .16000 and the subsequent 2 tiers should be differentiated by equally proportional deltas.
 - b. SDG&E is ordered by the CPUC to refund \$70 million for SONGS costs in 2014 summer rates. The refund is allocated to all three tiers based upon kWh consumption.

SDG&E Response:

Please find below revised Attachment B [*Attachment B – SDCAN DR 1 Q1.xlsx*] reflecting the scenarios specified above.

Consistent with OP 7 of D.13-10-053, the implementation of SDG&E's 2013 ERRAs Forecast (A.12-10-002) in AL 2544-E included adjustments for the difference between normal SONGS costs and SONGS replacement costs included in San Diego Gas & Electric Company's 2013 ERRAs forecast ("net SONGS costs"), an adjustment of approximately \$70 million. The \$70 million adjustment is not a refund to customers. SDG&E may request recovery of the net SONGS costs, which will be tracked in the SONGSOMA, in SONGS Investigation OII, after the Commission has finalized the methodology for calculation of the reasonableness of recovery of such costs. SDG&E includes in response to (b.), adjustments to scenario (a) to reflect a \$70 million reduction to commodity rates applied equally to all tiers.

EXCERPT FROM SDG&E ATTACHMENT B

DESCRIPTION (A)	TOTAL RATE w/ COMMODITY ADJ. (O)
Schedule DR	
Basic Service Fee	0.00
Summer	
Baseline Energy	0.15620
101% to 130% of Baseline	0.23099
131% to 200% of Baseline	0.23099
Above 200% of Baseline	0.34075
Winter	
Baseline Energy	0.15620
101% to 130% of Baseline	0.21876
131% to 200% of Baseline	0.21876
Above 200% of Baseline	0.30578
Minimum Bill	0.17

ATTACHMENT C

DO CONSUMERS RESPOND TO MARGINAL OR AVERAGE PRICE?



EI @ Haas WP 210R

Do Consumers Respond to Marginal or Average Price? Evidence from Nonlinear Electricity Pricing

Koichiro Ito

Revised October 2012

This paper is part of the Energy Institute at Haas (EI @ Haas) Working Paper Series. EI @ Haas is a joint venture of the Haas School of Business and the UC Energy Institute that brings together research and curricular programs on energy business, policy and technology commercialization.

Energy Institute at Haas
2547 Channing Way, # 5180
Berkeley, California 94720-5180
<http://ei.haas.berkeley.edu>

ATTACHMENT D

RETHINKING REAL-TIME ELECTRICITY PRICING

Author's personal copy

Resource and Energy Economics 33 (2011) 820–842



Contents lists available at ScienceDirect

Resource and Energy Economics

journal homepage: www.elsevier.com/locate/ree



Rethinking real-time electricity pricing

Hunt Allcott

Department of Economics, New York University, 19 W. 4th St., 6th Floor, New York, NY 10012, United States

ARTICLE INFO

Article history:

Received 15 March 2010
Received in revised form 10 June 2011
Accepted 14 June 2011

JEL classification:

C93
L51
L94
Q41

Keywords:

Real time electricity pricing
Energy demand
Randomized field experiments

Abstract: Most US consumers are charged a near-constant retail price for electricity, despite substantial hourly variation in the wholesale market price. This paper evaluates the first program to expose residential consumers to hourly real-time pricing (RTP). I find that enrolled households are statistically significantly price elastic and that consumers responded by conserving energy during peak hours, but remarkably did not increase average consumption during off-peak times. The program increased consumer surplus by \$10 per household per year. While this is only one to two percent of electricity costs, it illustrates a potential additional benefit from investment in retail Smart Grid applications, including the advanced electricity meters required to observe a household's hourly consumption.

© 2011 Elsevier B.V. All rights reserved.

1. Introduction

Because electricity is very costly to store, wholesale prices vary from day to day and often fluctuate by an order of magnitude between low-demand nighttime hours and high-demand afternoons. Nearly all retail consumers, however, are charged some average price that does not reflect the wholesale price at the time of consumption. In theory, economists have long recognized that this creates allocative inefficiencies, and there is a long literature¹ on “peak load pricing” and “real-time pricing.” In practice, the welfare implications of correcting this inefficiency fundamentally depend on how price elastic consumers are.

E-mail addresses: hunt.allcott@nyu.edu, allcott@mit.edu.

¹ The earliest peak load pricing discussion dates to Houthalder (1951), Steiner (1957), and Williamson (1966). Recent theoretical and simulation analyses include Borenstein (2005, 2007a,b), Borenstein and Holland (2005), and Holland and Mansur (2006, 2008).

0928-7655/\$ – see front matter © 2011 Elsevier B.V. All rights reserved.
doi:10.1016/j.reseneeco.2011.06.003

ATTACHMENT D

EXCERPT FROM JBS ENERGY TESTIMONY IN A. 11-10-002

Residential Customer Characterization

To provide support to the work by SDCAN witness Laura Norin of MRW and Associates, we are providing information on differences in load pattern by size of customer (from SDG&E's residential load research sample) and on economic and demographic factors that affect customer usage in the SDG&E service territory (from the Residential Appliance Saturation Survey or RASS data base). The work done here is similar to work that JBS Energy has done for all of the California utilities on several occasions, as well as for utilities in Nevada.

Our findings from SDG&E's load research data are that smaller customers have better load patterns than larger ones. This finding is consistent with SDCAN's finding in previous cases dating back to 2000. The RASS analysis shows that usage, while not in lockstep with income, has a significant association with income; in particular that the richest customers on average use more energy. This association arises in part because of strong correlations between income and the square footage and type of dwelling and the presence of energy-consuming equipment such as central air conditioning and swimming pools.

A. Overview

In general, because the mid climate zone using baseline quantities was larger and included portions of cooler CEC climate zones, both the cool zone and mid zone had slightly less energy use per customer because the customers used more than average for the cool zone and less than average for the mid zone. *We stand by the general conclusions presented in testimony but wish to accept SDG&E's help in assuring that this analysis is correct.*

During rebuttal to Mr. Marcus' testimony, SDG&E pointed out that the RASS portion of our analysis used California Energy Commission (CEC) Title 24 climate zones to group customers instead of SDG&E baseline zones, even though SDG&E provided SDGE baseline zones for each customer.

We appreciate SDG&E telling us that a variable for the baseline zones was assigned to each customer, a field that we overlooked in the nearly 800 data fields contained in the dataset, as it was given the name UTILSDGE. The Title 24 Climate zones were identified three times in both sets of consumption data (gas and electric) and additionally in the RASS data using fieldnames such as "T24CZ", and corresponds closely to the baseline zones, so the effect on the results is minimal. The late delivery of the dataset also hurried our initial review.

The following updates the original testimony section titled "Relationship of Usage to Income, Size and Type of Dwelling, and Appliances" beginning on

page 29 and the associated “Attachment E: Methodology for Analysis of Residential Appliance Saturation Survey”.

B. Relationship of Usage to Income, Size and Type of Dwelling, and Appliances

We next examine the reasons why small customers use less energy and have better load patterns than larger customers. We also examine relationships of consumption, among single-family and multi-family customers by income.

At a high level, consumption is not in lockstep with income. However, there are relatively strong correlations between consumption, size of dwelling, whether the dwelling is single and multi-family, saturation of energy consuming appliances such as central air conditioners and swimming pools, and income. As a result, the proposals by SDG&E will give disproportionate rate breaks to large customers who are more likely to have central air conditioners and swimming pools that contribute to peak loads and who tend – on average - to be more affluent, while raising rates to CARE customers and many other smaller customers who own less peak-heavy equipment.

We divided the SDG&E system into three climate zones groups – Cool, Mid, and Hot, based on the SDG&E baseline zones and associated weather stations that each customer was assigned to. The cool zone was SDG&E zone 1: the coastal

baseline zone. The Mid climate group was the SDG&E inland (SDG&E zone 2) and mountain (SDGE zone 4) baseline zones which had similar baseline quantities. The Hot Zone Group was SDG&E baseline zone 3: low desert). We have not reported results for SDG&E's hot zone, due to a statistically insignificant number of RASS survey responses (only 20 respondents).

We broke the customers in each climate zone into groupings based on the average use of the four inner summer months (June-September 2008). Each grouping was roughly based on the average monthly summer quantities in the Cool and Mid zones (less than 130% of average basic baseline, 130-200%, 200-300%, and over 300%) rounded to the nearest 10 kWh per month.

Our definition of which tier group a customer falls into is based on a monthly average of the four peak summer months. In our analysis, a customer is in a Summer Tier Group if the monthly average of the four summer months' consumption falls within the Summer Tier Group range. These groups roughly correspond to usage in each tier (though there may be some small amounts of spillover into the higher tier in the warmest summer months).

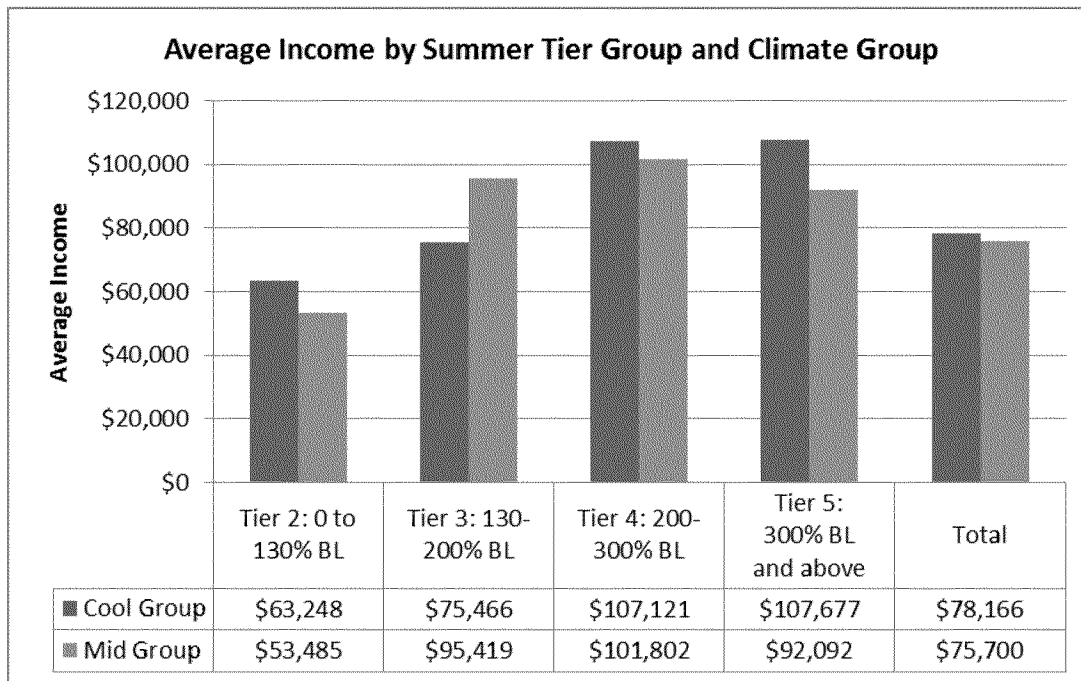
We cross-tabulated and analyzed income by tier grouping, and by whether customers were single-family and multi-family in each of the climate zones. We also analyzed the saturation of central air conditioning and swimming pools by income and by tier grouping and analyzed the relationship of the square footage of dwellings to tier grouping and income.

More methodological information is contained in Attachment E.

1. Income

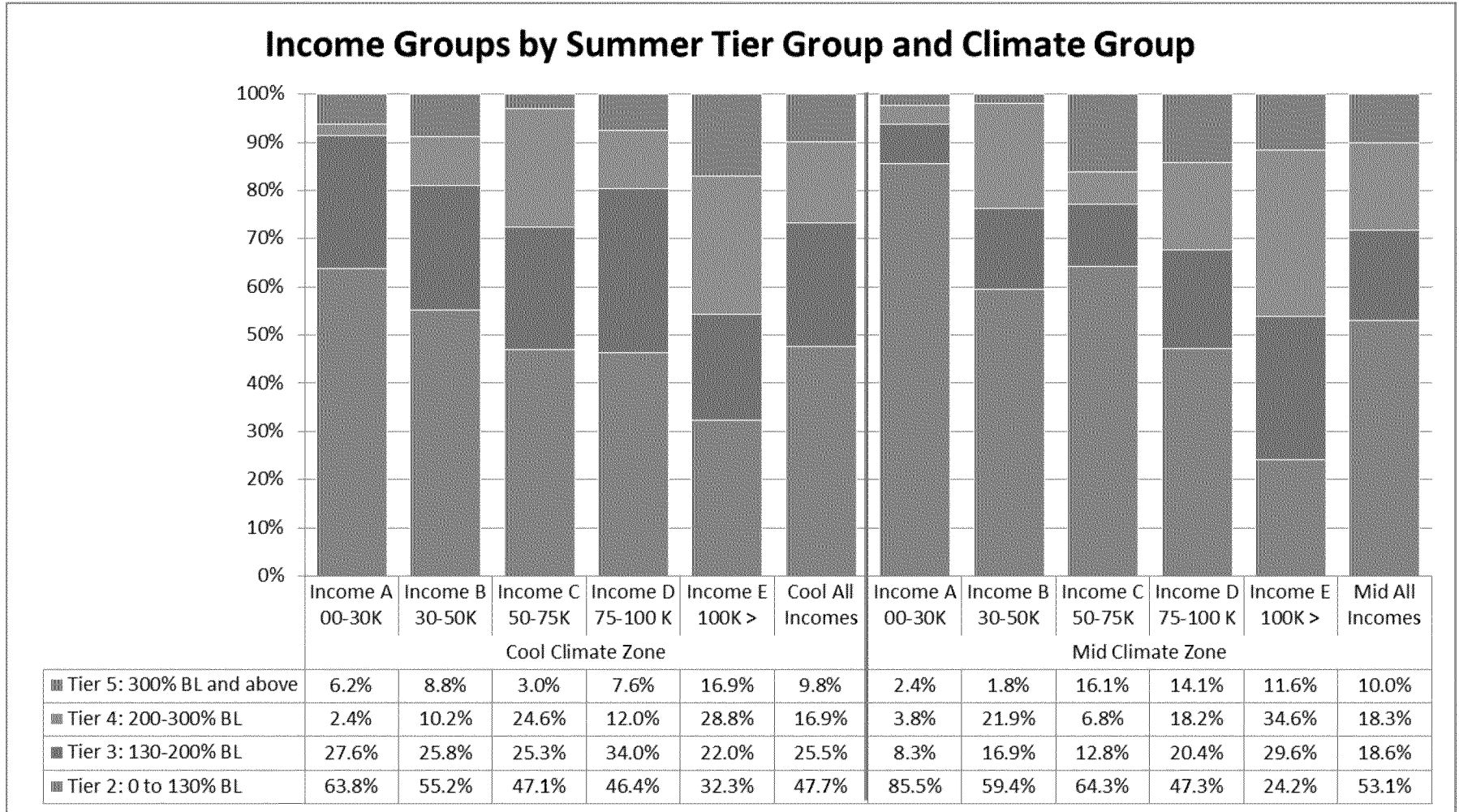
In the SDG&E zones, usage (measured by Summer Tier Group) increases with income in the cool and mid climate zones.

Figure 1: Average Income by Summer Tier Group and Climate Group



The percentage of customers with income under \$30,000 who had Tier 4 or 5 usage (average monthly use above 200% of baseline in those four summer months) was 8% in the cool zone and 6% in the mid zone. By comparison the percentage of customers over \$100,000 with Tier 4 use was 41% in the cool zone and 48% in the mid zone.

Figure 2: Income Percentages by Summer Tier Group and Climate Group SDGE



The reason is clear. Higher incomes are associated with larger dwellings, more saturation of central air conditioning, and more swimming pools, as shown below. We start with an examination of usage, income, and type of dwelling as related to square footage.

2. Single vs. Multi-Family

Multifamily customers use considerably less than single-family customers as shown in the two figures below. Over 70% of multi-family customers use less than 130% of baseline on average while very few use more than 200% of baseline.

Figure 3: Percent of Single-Family and Multi-Family Households within Tier Groups and Climate Zones SDGE

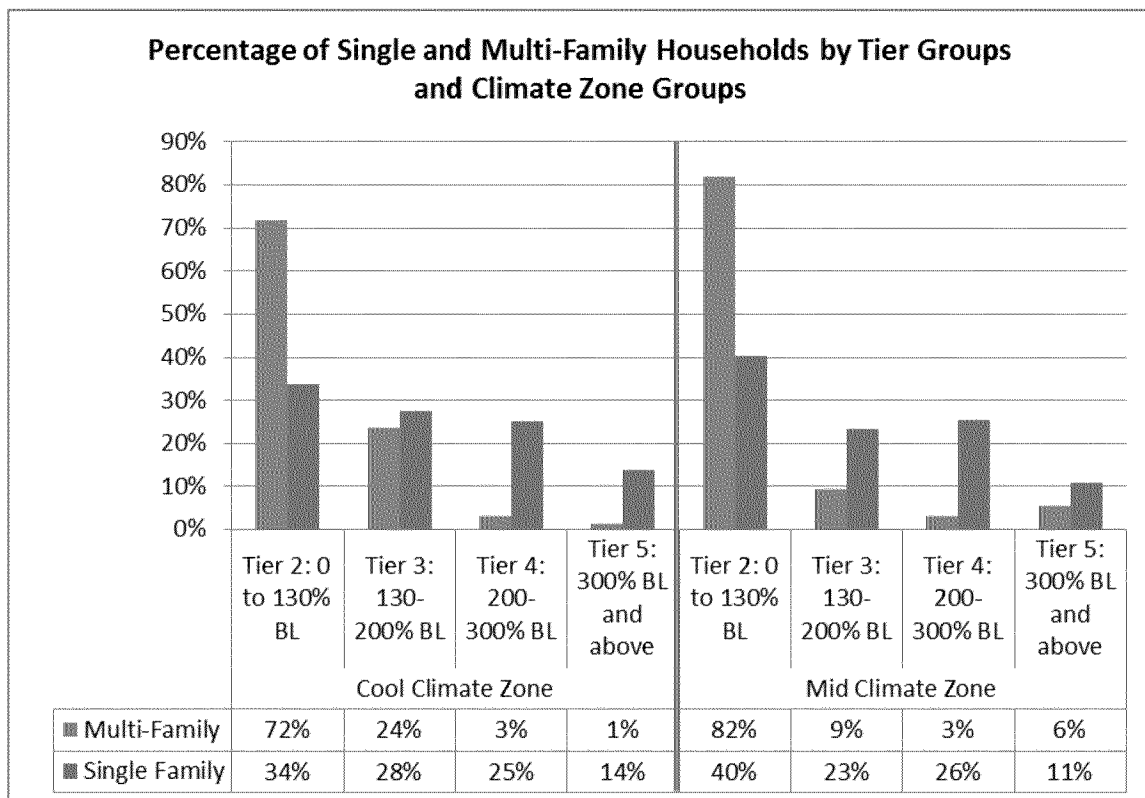
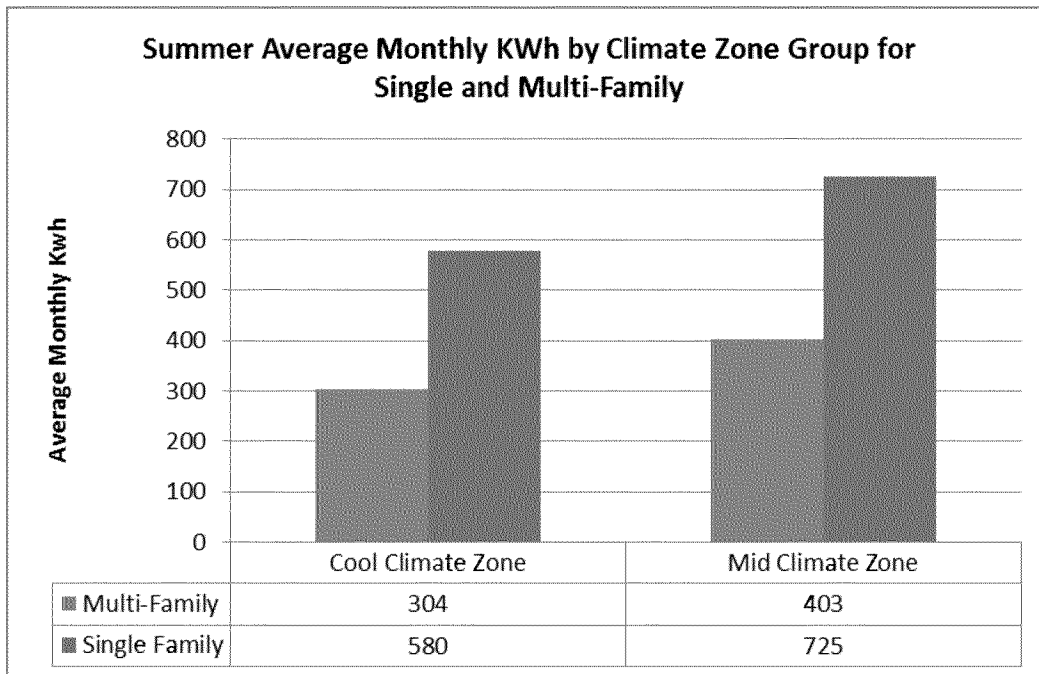


Figure 4: Summer Average Monthly Kwh by Single-Family and Multi-Family Households



Multifamily customers use about 45% to 48% less than single-family customers in both of the major climate zones. This phenomenon can be expected because of the smaller size of the dwellings and common walls that reduce heat gain and loss, as well as income differences that may affect usage.

There also are large differences in income between single-family and multi-family dwellers. While a majority of households in all income groups live in single-family dwellings in SDG&E's service area as a whole, the proportion rises from 32% to 87% as income rises.

Figure 5: Percent of Single-Family and Multi-Family Households within Income Groups SDGE

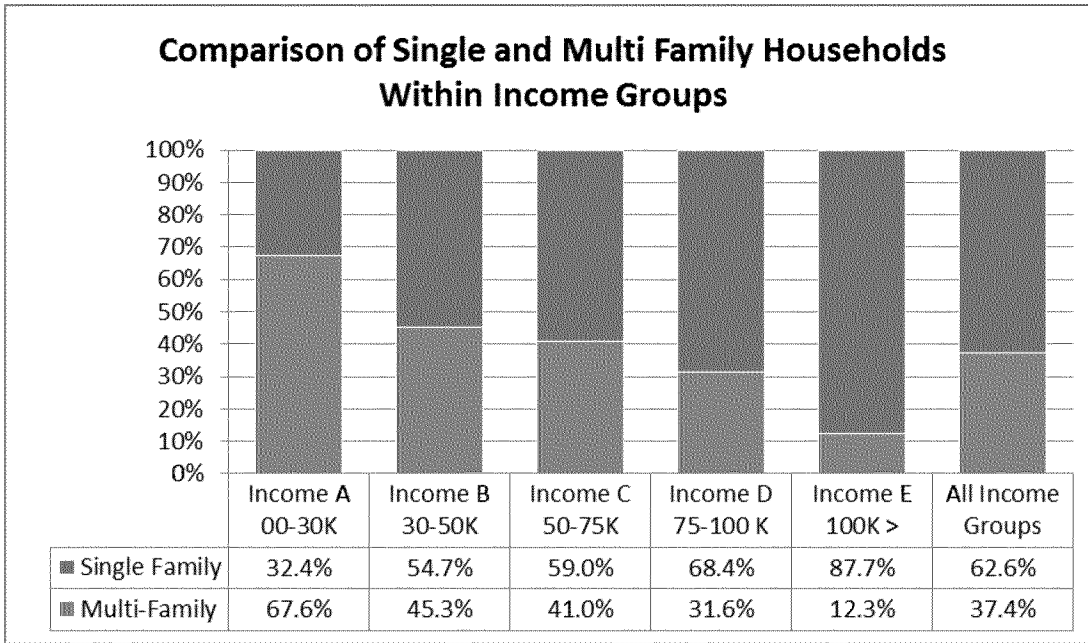
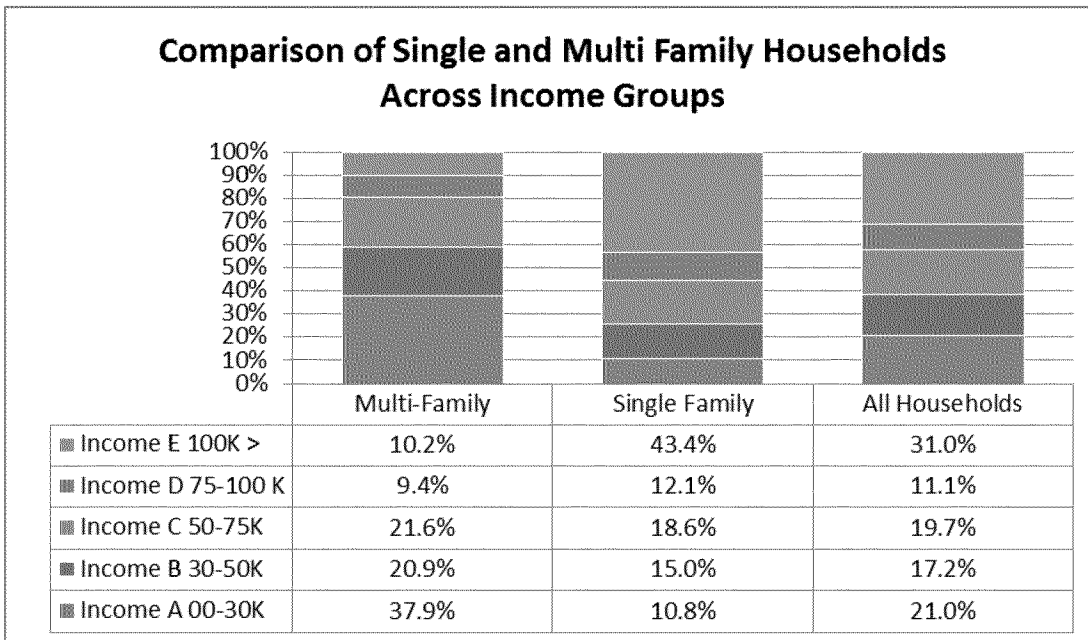


Figure 6: Percent of Single-Family and Multi-Family Households across Income Groups SDGE



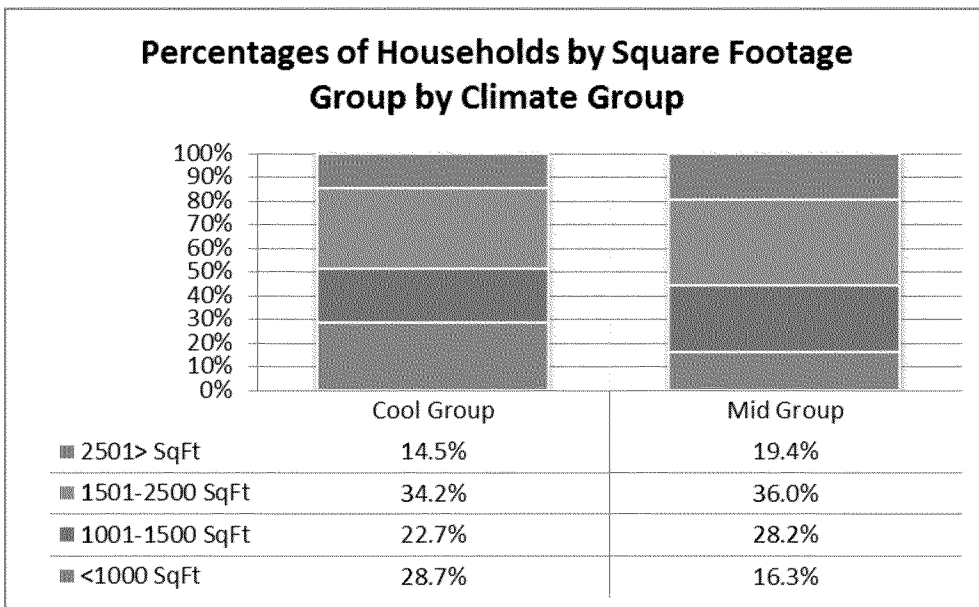
On the SDG&E system as a whole, 55% of single-family dwellers earned more than \$75,000, compared to 20% of multi-family households. Both climate zones

showed a disproportionate percentage of households under \$30,000 in multifamily units as expected.

3. Square Footage

Figure 7 shows the percentage of dwellings by square footage. The more urbanized cool area has more dwellings under 1500 square feet than the suburban inland area.

Figure 7: Percent of Households by Square Footage



Average usage generally increases with square footage. (Figure 8).

Figure 8: Average Summer Monthly KWh Usage by Climate Group and Square Footage SDGE

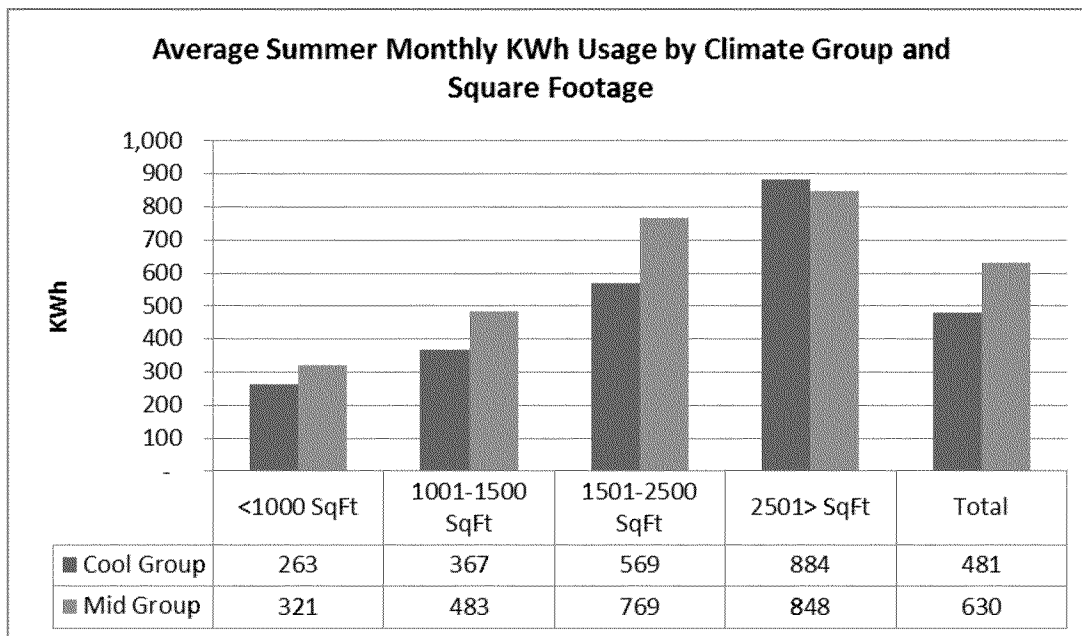
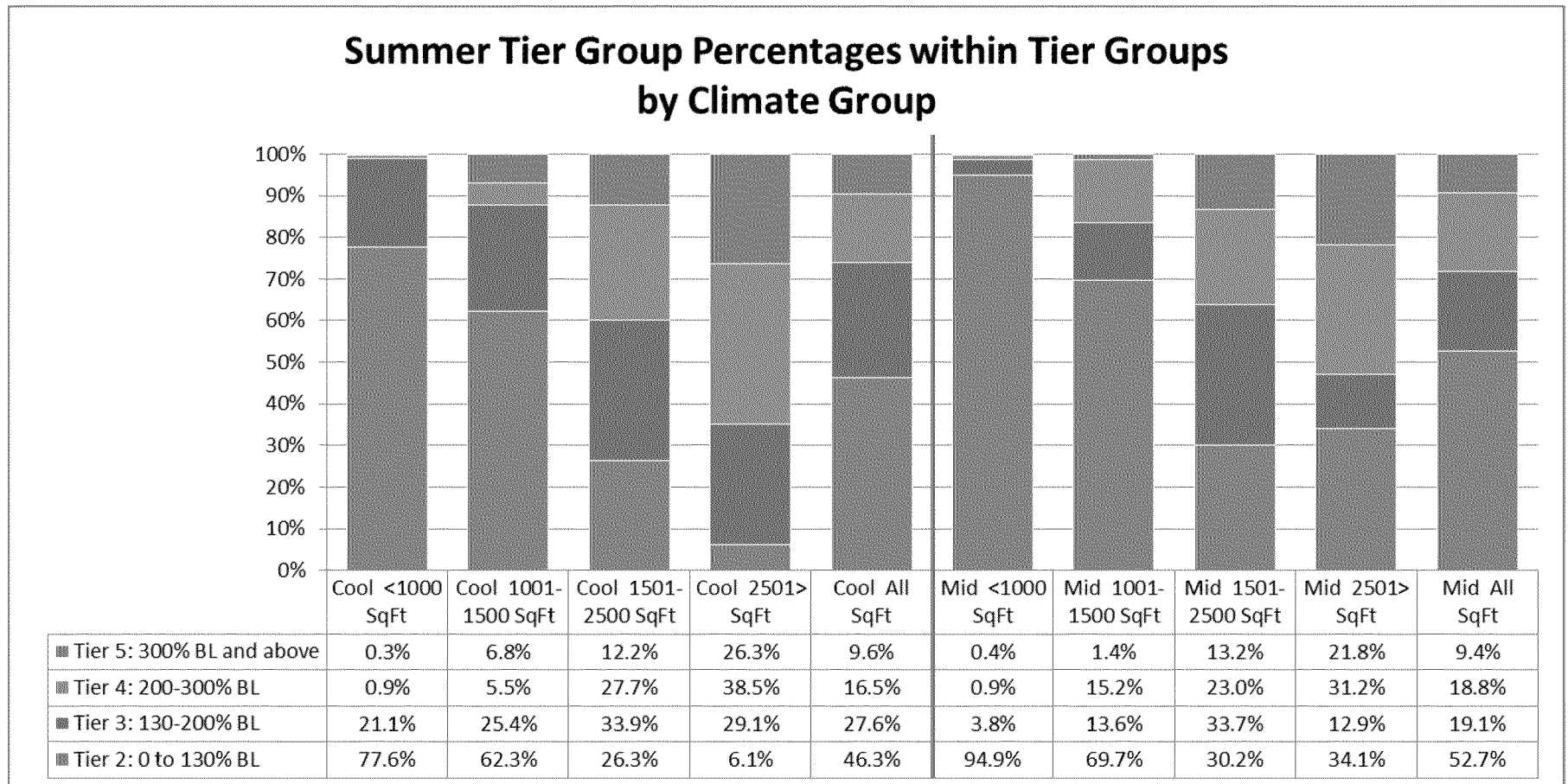


Figure 9 computes the percentage of customers with usage in each tier with dwellings of a given size. For those in dwellings less than 1000 square feet, 77% in cool zones and 95% in mid zones were at or below Tier 2 levels. Only 6.1% of those in cool zone dwellings over 2500 square feet and 34% in mid zones were in the Tier 2 range. In these large dwellings, 53% in the mid zone and 65% in the cool zone had average summer usage that fell into Tier 4 or Tier 5.

Figure 9: Percentage in Tiers 2-5 (Average Summer Monthly Use) by Square Footage of Dwelling SDGE



There is a strong correlation between square footage of dwellings and income. Of those in dwellings over 2500 square feet, 47 to 75% (depending on climate zone) earned more than \$100,000. Very few people earning over \$100,000 lived in dwellings under 1,000 square feet – 13% in the more urbanized cool zone, and 9% in the mid zone (Figure 10).

Figure 10: Square Footage within Income Groups by Climate Zone SDGE E

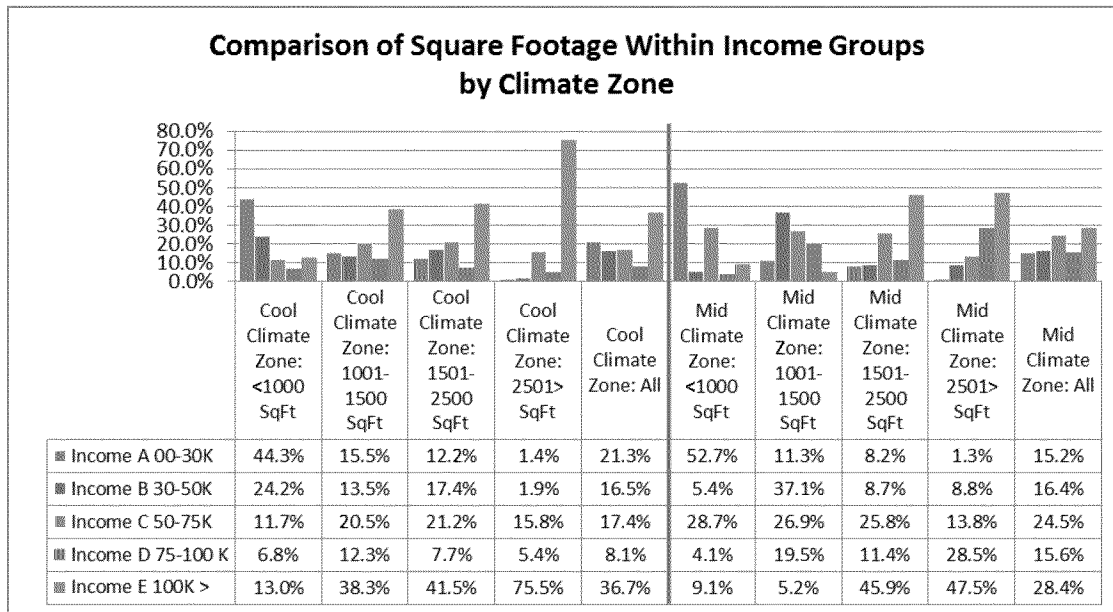
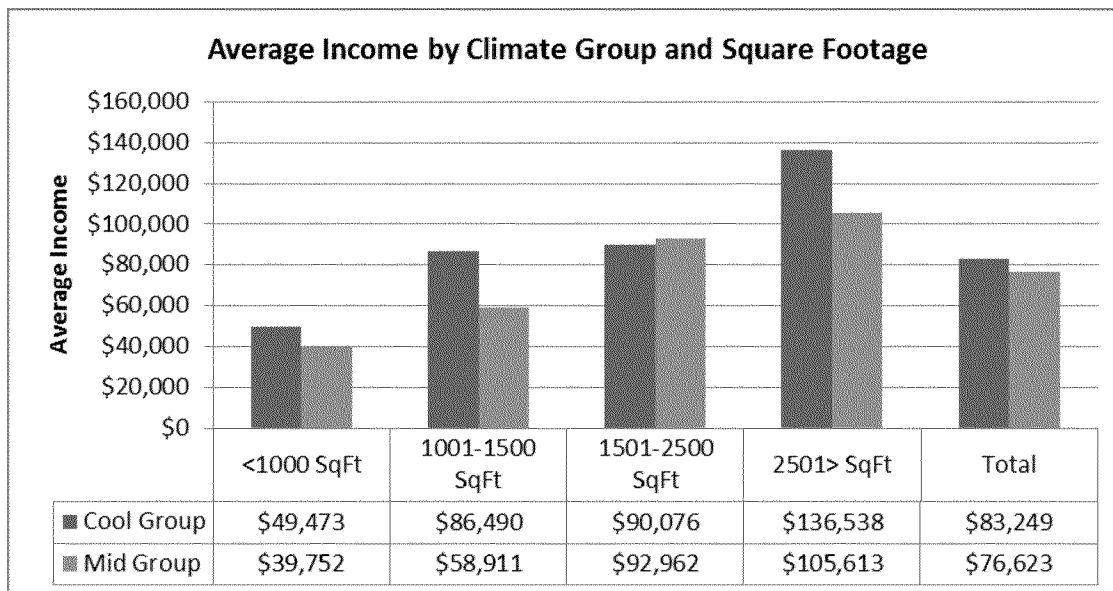


Figure 11: Average Income by Climate Group and Square Footage SDGE

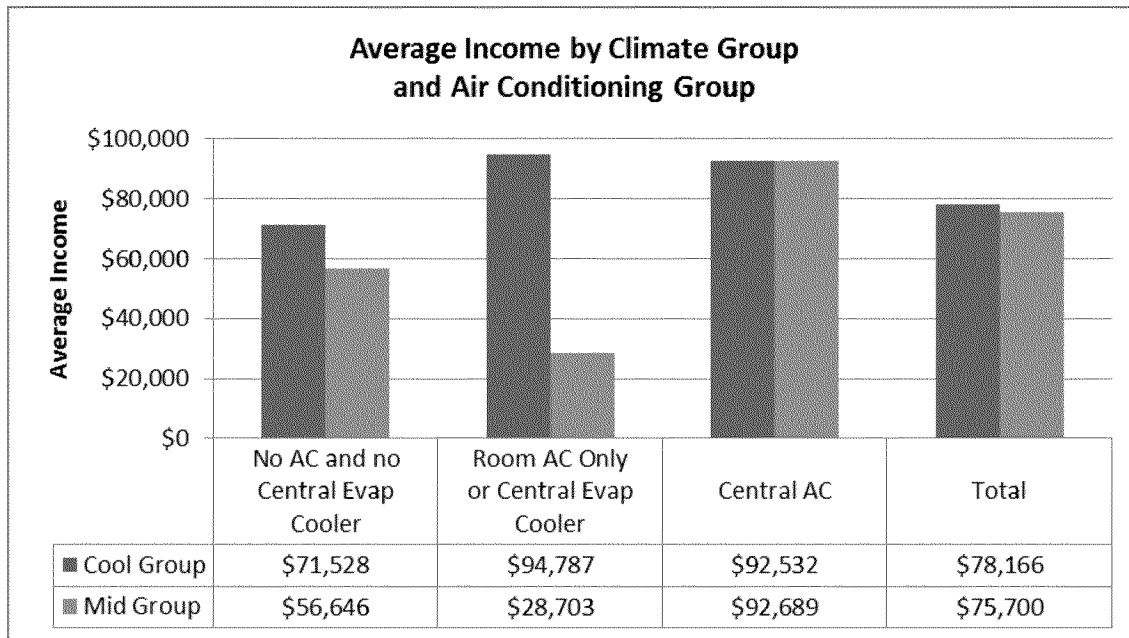


4. Air Conditioning

Appliance such as air conditioners and swimming pools also affect summer peak usage and saturation of these appliances is correlated with income.

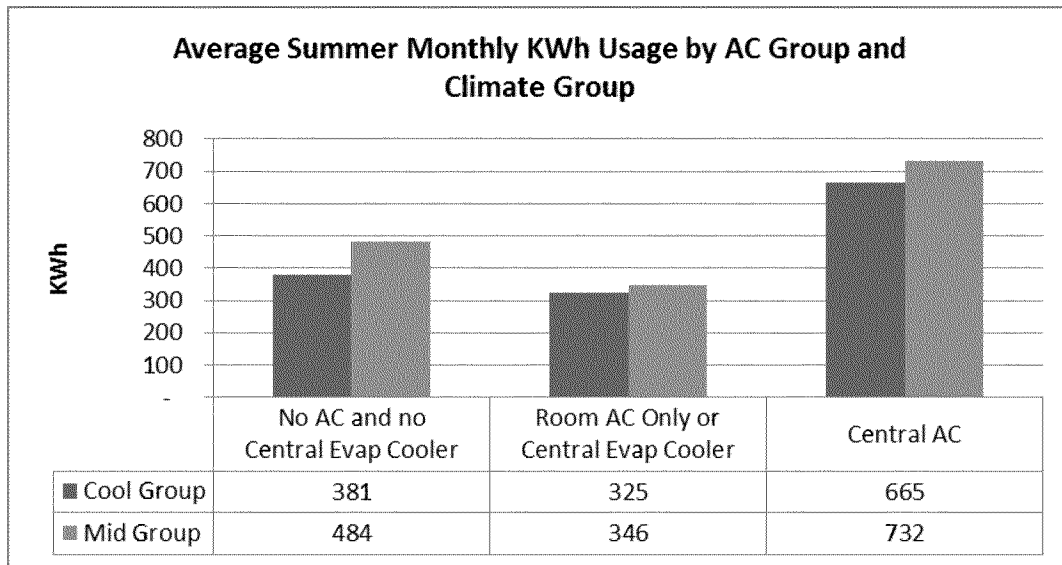
The average income of a central air conditioning user is higher in all climate zones. See Figure 12.

Figure 12: Average Income by Air Conditioner Type and Climate Group SDGE



Relative to having no air conditioner, a central air conditioner increases average monthly summer usage by 74% in the cool zone (an increase of 284 kWh per month) and about 51% in the mid zone (an increase of 248 kWh per month).

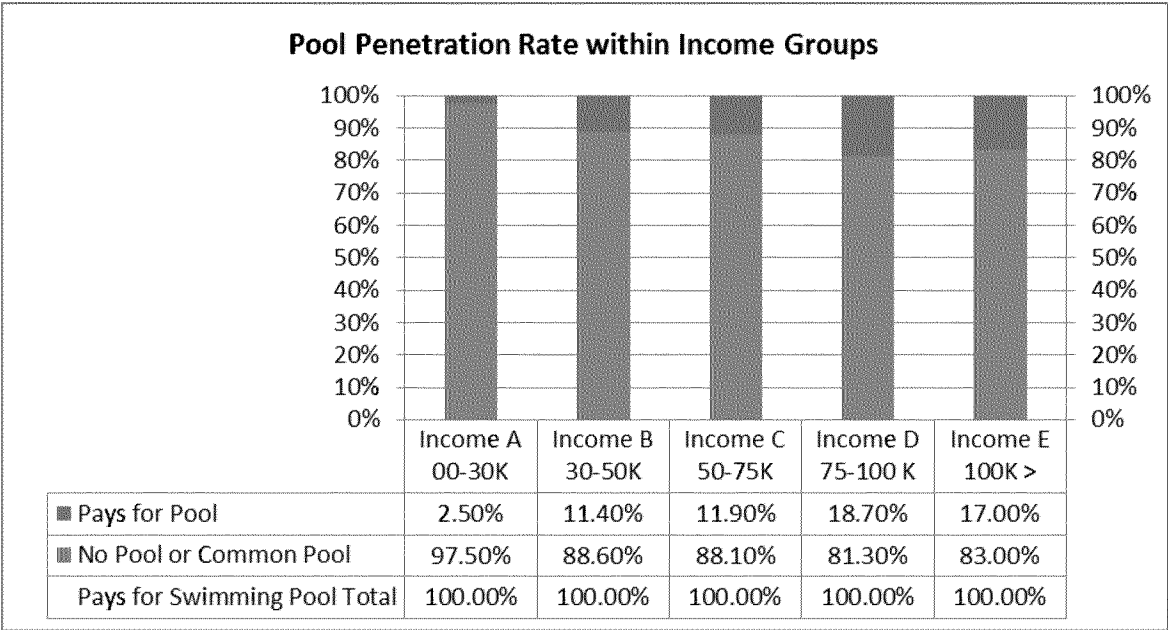
Figure 13: Average Summer Monthly Usage by Air Conditioner Type and Climate Zone Group SDGE



5. Swimming Pools

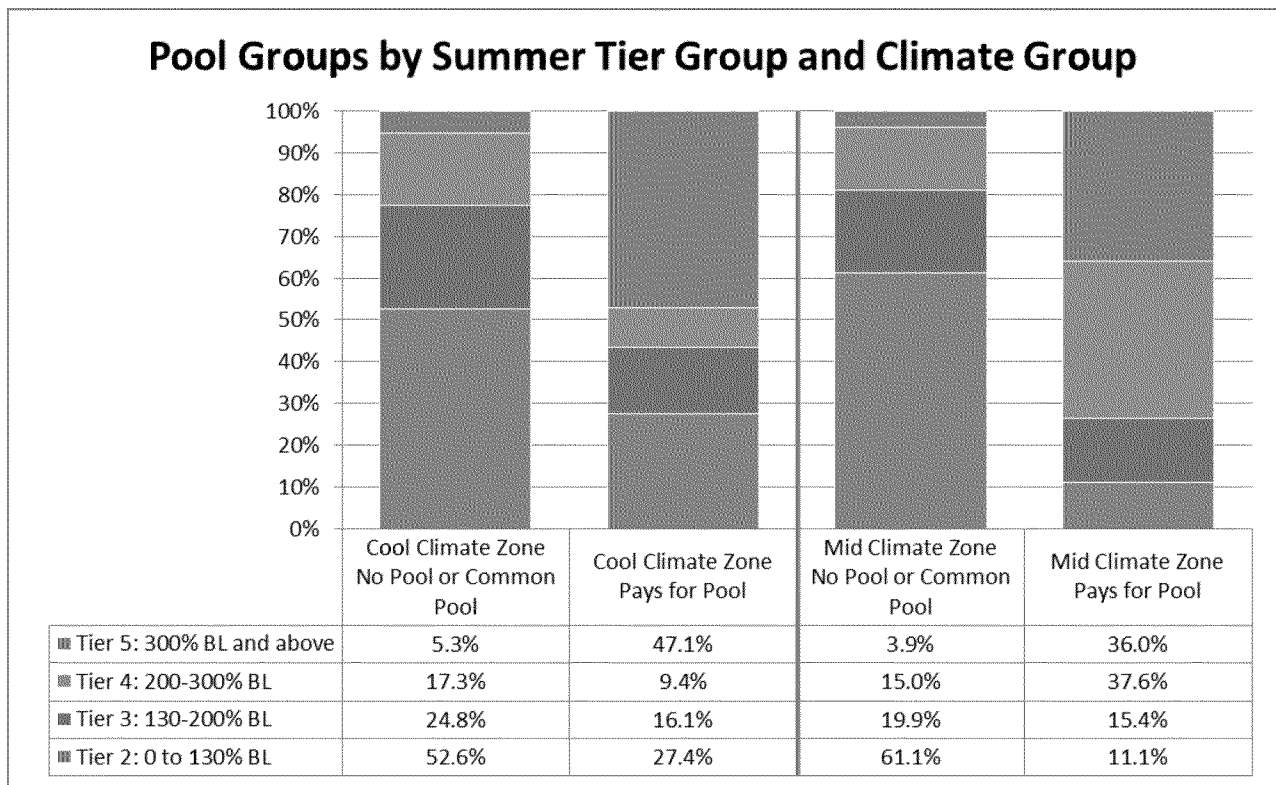
Swimming pools also are correlated with energy use and income. Customers must have *and pay* for the energy it uses before they are counted as having a pool. Pools in common areas are grouped with those without a pool. It should be noted that virtually no one in a multifamily dwelling has a pool. Thirteen percent of households have pools. They use more energy and have higher incomes than other households. Pool users tend to fall into higher tier groups, and their usage is higher.

Figure 14: Pool Ownership across Income Groups SDGE



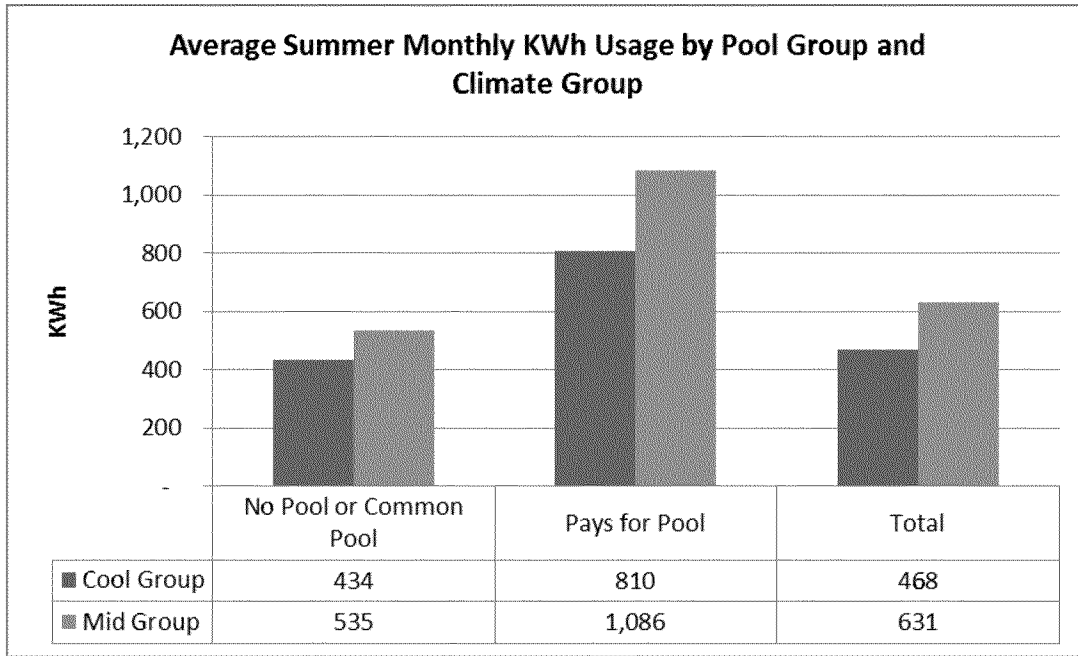
As expected, there are very few swimming pool owners at the low end of income; it rises to 17-19% for incomes over \$75,000.

Figure 15: Single-Family Pool Groups by Summer Tier Groups and Climate Group SDGE



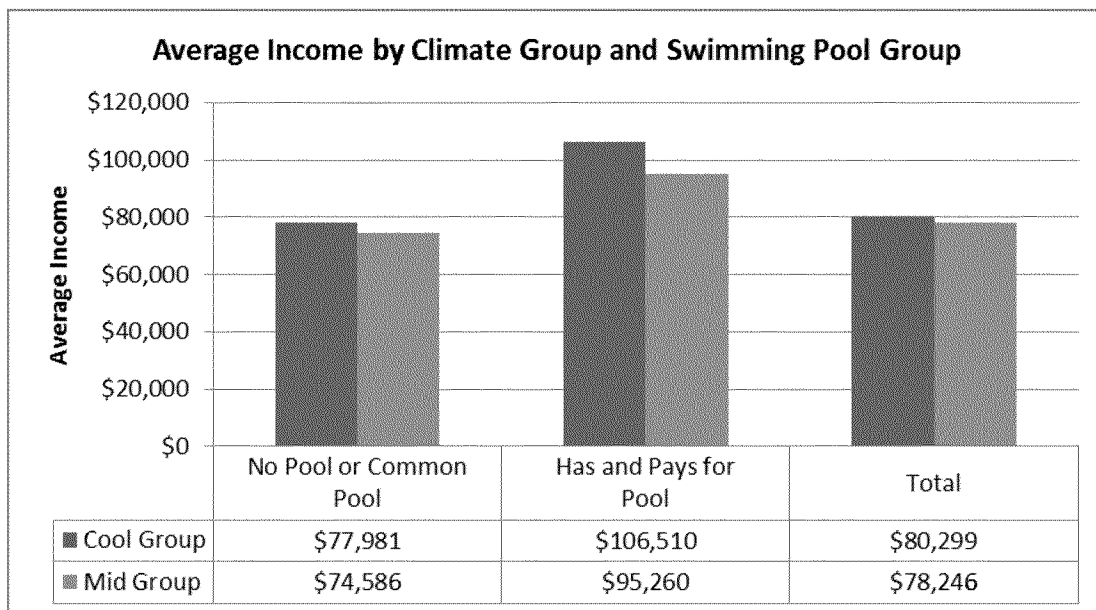
In the cool to mid climate zones, a pool owner has usage that is 86-103% higher than a household without a pool, an increase of 376 kWh per summer month in the cool zone and 551 kWh per month in the mid zone. (Figure 16) The increase in usage with a swimming pool appears larger than with Edison and may be correlated with other factors.

**Figure 16: Average Summer Monthly Kwh Usage by Pool Group and Climate Group
SDGE**



As shown in Figure 17, average incomes of pool owners are 26-33% higher than of those without swimming pools.

Figure 17: Average Income by Swimming Pool Group and Climate Group SDGE



6. Conclusion

The RASS data provided by SDG&E provides support for the contentions that lower users who will be charged more by a customer charge are of lower income, are more likely to live in apartments and smaller dwellings in general, and do not have as much peak-oriented energy consuming equipment (central air conditioners and swimming pools).