BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking on the Commission's Own Motion to Conduct a Comprehensive Examination of Investor Owned Electric Utilities' Residential Rate Structures, the Transition to Time Varying and Dynamic Rates, and Other Statutory Obligations.	RULEMAKING 12-06-013 (FILED JUNE 21, 2012)

NOTICE OF AVAILABILITY OF THE SAN DIEGO CONSUMERS' ACTION NETWORK RESIDENTIAL RATE DESIGN PROPOSAL

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I. SDCAN's OPTIMAL RATE DESIGN PROPOSAL

Pursuant to the Assigned Commissioners and ALJ's November 26, 2012 Scoping Memo, San Diego Consumers' Action Network (SDCAN) herein offers a rate design proposal for the Commission's consideration. SDCAN offers a detailed discussion of an optimal residential rate design structure based upon the principles set forth in the Scoping Memo with one exception that will be discussed in greater depth below. SDCAN's proposed rate structure has three elements:

1. Contains no fixed charges other than a minimum bill;
2. Has three or four highly differentiated tier levels; and
3. The rate structure is a strictly voluntary TOU rate structure that rewards customers who choose to opt-in.

The two exceptions to the principles contained in the Scoping Memo are Principle #10: "……rate structure should emphasize customer education and outreach that enhances customer understanding……..." SDCAN's proposed design is based upon the thesis that the Commission should be designing a rate structure that would encourage third-party energy management companies to optimize customer consumption patterns to achieve savings for customers. In turn, the energy management companies would take the lead in customer education and hardware deployment. SDCAN submits that if this emerging industry doesn't embrace the rate design reform ultimately adopted by the Commission, then the effort will be doomed to failure and the residential class will be detrimentally impacted by the reforms.

These comments do not include a utility-specific rate design. SDCAN was unable to use the rate calculators of the three utilities to create an easily comparable and accessible set of specific rates. Moreover, SDCAN wished to avoid undue scrutiny on the output of a bill impact calculator that it did not design. However, SDCAN submits that the guidelines discussed below give the Commission sufficient information in which to assess SDCAN's proposed rate structure. It does not represent a significant departure from rates that are currently in effect or are before the Commission for consideration in other related proceedings.

A. DESIGNING A RATE STRUCTURE USABLE BY RESIDENTIAL ENERGY MANAGEMENT PROVIDERS

Perhaps the most essential building block for SDCAN's proposed rate design is that will be the device retailers and/or the third-party aggregators who, if enticed into the California markets, will play a major role in educating customers and effecting the adoption to real-time rates. A12ny serious reform of residential rate design will have failed if it does not facilitate the deployment of new energy technologies and private energy management service companies serving residential customers. SDCAN's vision for the emerging real-time price environment is one of helping to build a market for new services available to the residential and small business markets. The way energy is transmitted to consumers, the way consumers receive their energy use data, the technologies used by customers and the role of the consumer in energy management need to change in order for consumers to take advantage of the sizeable investment being made in the Smart Grid investments made by California IOUs. An essential complement to these changes will be a marketplace where third parties will be providing energy and energy-related services that have not previously been available to residential consumers.

For the residential consumer, whether new rate designs are embraced will be dependent, in large part, upon the success of energy management services. Third-party companies will need to deploy and likely use net-based applications and/or in-home technologies to permit customers to take advantage of real-time pricing schedules.

SDCAN submits that the Commission is obligated to consider the development of energy management companies servicing residential customers in its rate design goals. Senate Bill 17 states that "by July 1, 2010, the Commission, in consultation with the Energy Commission, the ISO, and other key stakeholders shall determine the requirements for a smart grid deployment plan consistent Section 8360 and federal law, including the provisions of Title XIII (commencing with Section 1301) of the Energy Independence and Security Act of 2007 (Public Law 100-140).

Section 8360 lists numerous requirements that must be achieved as they are necessary requirements of a Smart Grid. Section 8360(j) requires the "Identification and lowering of unreasonable or unnecessary barriers to adoption of smart grid technologies,

practices, and services." SDCAN submits that consumers will not adopt these technologies, practices and services unless rate design incorporates this objective.

In addition, SDCAN notes that "smart" technologies will provide the opportunity for tiered pricing to work more effectively in an energy management paradigm. As noted above, the recent deployment of smart meters creates the opportunity for third-party energy management companies to access and 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. Thus, the Commission should be challenging any and all parties who seek to reduce or eliminate this long-standing and successful conservation incentive.

The role of these third-party management intermediaries is essential because it is very clear to SDCAN that residential customers are *not* prepared to make the time investment necessary to analyze and choose optimal rate structures or electric consumption. The price elasticity and responsiveness of the residential class has been examined recently by Koichiro Ito (Stanford) and Hunt Allcott (NYU) with surprising results.[1] The Commission cannot safely assume that residential customers will respond to time-sensitive or consumption-sensitive rates in a predictable fashion.

For these reasons, SDCAN has chosen to advance a rate design that is designed to promote investment by third-parties to offer energy technologies and energy management services to what has been a largely overlooked class of customers. It contains a heavily volumetric rate with substantial tier differentiation that gives energy management providers sufficient incentives to find savings for customers and to fund the hardware necessary to effectuate those savings. Throughout this submission, SDCAN refers to these rate plans as "incentive rates". They are opt-in marginal-cost based pricing that rewards customers who change their consumption patterns.

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[1] Embedded links to each of their published papers has been included as Attachment A and Attachment B, accordingly. Each of these papers challenge the conventional wisdom that customers respond to marginal pricing in the manner in which economists would expect. They are discussed in greater depth in section IV below.

B. SDCAN APPLIES A MINIMUM BILL RATHER THAN A CUSTOMER CHARGE

The concept advanced by the utilities of a customer charge is an attempt by these IOUs to increase revenue recovery via fixed charges. This rate design runs counter to long-standing California state policy that encourages energy efficiency and renewable distributed generation. It also undermines the usefulness of the smart grid infrastructure that was recently implemented. The proposal should be rejected because:

- It would send the wrong price signals to residential customers;
- It would discourage state policies promoting efficiency and renewable self-generation;
- It punishes the most energy efficiency-conscious customers.

In its proposed rate design, SDCAN urges the continued use of minimum bills so that customers who use little or no power contribute to fixed costs but that the vast majority of residential customers do not incur the detriments of fixed price rate design.

1. Fixed Charges Send the Wrong Price Signal

Fixed customer charges would dampen customers' incentives to reduce their use of grid energy. This approach conflicts with California energy policy objectives of aggressively pursuing energy efficiency and renewable distributed generation, policy objectives that the Commission has deeply integrated into the ratemaking process for the state's electric utilities.

Energy efficiency and renewable generation have long been cornerstones of California's energy policy, and their importance has increased in recent years. California's Energy Action Plan, adopted by the Commission in May 2003, established energy efficiency and demand response as the first resources in the "loading order" of resources used to meet the state's energy demand, followed by renewable resources.[2] These resources are also key to achieving the state's ambitious goals for reducing

[2] State of California Energy Action Plan I, page 4.

greenhouse gas emissions. In 2008, California's energy agencies found that energy efficiency is "the most important tool for addressing greenhouse gas emissions in the energy sector."[3]

Fixed residential customer charges also run counter to energy conservation goals. DRA shares SDCAN's perspective. It notes that the Commission recently ruled that a customer charge offers no conservation price signal and cited this as a reason to reject PG&E's proposed residential customer charge.[4]

Even where the IOUs attempt to offset the proposed increases in fixed charges by corresponding reductions in volumetric charges in order to maintain revenue neutrality, a higher share of costs would be unavoidable and a smaller share would be tied to energy usage. This would reduce the financial benefit of energy conservation and reduce the cost of increasing energy usage.

2. Discourages Customer-Based Renewable Self Generation

Customer charges also discourage renewable distributed generation by increasing the payback period for such investments. Customers that already have distributed generation would likewise see reduced benefit under SDG&E's proposal, as their monthly utility bills would increase to cover the higher fixed charge and their net metering savings would fall with the reduction to volumetric rates.

In contrast to the IOUs' misguided logic that its rate design proposals "will enable customers to make good economic decisions regarding electricity use and the use of new technologies" and that "California's movement toward a low carbon future also calls for transitions to a rate structure that assigns utility costs more accurately and fairly." Neither the Commission nor the utility have no factually-supported basis upon which to conclude that fixed costs will promote accurate economic decisions.

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[3] California Public Utilities Commission with California Energy Commission. *Energy Action Plan Update: 2008 Update*, February 2008, page 6, as presented in Attachment C. When the Air Resources Board approved the final AB 32 Scoping Plan as a road map to achieving greenhouse gas emission reductions, energy efficiency measures were second only to new standards for light-duty vehicles in the amount of emissions reductions to be delivered. After efficiency, renewable energy measures were next on the list, with additional targeted emission reductions specifically from renewable distributed generation via the Million Solar Roofs program

Furthermore, 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. A fixed monthly charge that is not linked to energy consumption and that cannot be avoided or reduced through lower energy use 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.

3. Customer Charges Penalize the Most Energy-Conscious Customers.

A customer charge would increase fixed costs and reduce volumetric charges for both residential and small commercial customers. This would disproportionately harm the lowest energy users within each customer class, since these customers would not receive sufficient energy charge reductions to offset their higher fixed fees. Specifically, in A. 11-10-002, SDCAN analyzed an implementation of a $3.00 monthly customer charge proposed by SDG&E and found that it would cause rate increases for consumers with the lowest consumption, offset by decreases for higher-usage customers.[5]

SDCAN also notes that low-income customers would also be subject to the fixed customer charge under a $3.00 monthly customer charge and these customers would be harmed even more than non-CARE customers. For example, in the coastal climate

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[4] D.11-05-047, pages 33 – 34.
[5] This analysis is included in Attachment C to this submission.

zone, this customer charge would increase bills by more than 5% for more than a quarter of CARE customers, with increases of more than 12.5% for the lowest consuming 5% of CARE customers.[6]

SDCAN's analysis of SDG&E's load research data showed that residential customers with lower incomes and energy use have better load patterns than larger, wealthier customers. 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. The RASS data analyzed by SDCAN confirmed 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). Thus, fixed customer charges have the undesirable result of providing financial relief to wealthy, energy-gobbling customers at the expense of SDG&E's more modest-income households. Absent compelling data justifying the change in state energy policy and accurate customer cost data implementation of customer charges are undesirable and create intra-class inequities.

4. Customer Charges Violate Current Law

Under Commission precedent, new rate charges regardless of whether the fee is fixed must comply with the rate cap established in SB 695.[7] The rate cap for non-CARE customers established in SB 695 is codified in Section 739.9 of the Public Utilities Code. In Decision 11-05-014, (Regarding Residential Rate Design in Application 10-03-014,

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[6] Attachment C, p. 11-12, 23. This disproportionate harm to low-income customers would arise for two reasons. First, for a given usage level, a $3 fixed fee is a proportionately higher share of the bill under CARE rates than under non-CARE rates (since CARE rates are lower than non-CARE rates). Second, as discussed in the Testimony of William Marcus on behalf of SDCAN, CARE customers on average have lower usage than non-CARE customers and therefore have less usage with which to offset the fixed fee. (p. 25, 30)

[7] See D.11-05-047.

Phase 2 of Pacific Gas & Electric's General Rate Case), the Commission held that fixed monthly costs must comply with Section 739.9. Specifically, the Commission stated, "based on our [the Commission's] analysis of the statutory provisions as discussed below, we do interpret Sec. 739.1(b)(2) and 739.9(a) as including fixed customer charges within the limitations on allowable percentage increases in 'rates for usage.' Thus, we [the Commission] are prohibited by law from approving PG&E's customer charge to the extent the total bill impacts exceed these statutory limitations on baseline rates increases."[8]

The customer charge proposed by Pacific Gas & Electric was a fixed $3.00 per month charge that Pacific Gas & Electric proposed in combination with the elimination of its current minimum charge.[9] The Basic Service Fee proposed by SDG&E is essentially the same as the customer charge proposed by Pacific Gas & Electric, as it is also a fixed $3.00 fee. SDG&E's Basic Service Fee is PG&E's customer charge but with a different name. Implementation of the Basic Service Fee must comply with the SB 695 cap requirement implemented in Section 739.9. The Network Use Charge, which is not fixed, but rather based on distributive consumption, must also comply with SB 695, as its application also impacts energy rates.

In A. 11-10-002, SDG&E sought to exploit an alleged ambiguity in that decision by asserting that the monthly Basic Service Fee it proposes differs from PG&E's because its reduce the residential Tier 1 (T1) energy rate. The key legal question raised by SDG&E's proposal was whether state statute protects *all* T1 customers or just the class average. Presumably, this issue will be resolved in the Commission's final decision in that matter.

However, the Commission must appreciate that SDG&E's argument creates a legal dilemma of black hole proportions for the Commission. If the Commission accepts this logic, then it could legally justify significant bill increases for an untold number of residential class customers, so long as the overall T1 average remained neutral.

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[8] D.11-05-047, mimeo, at 24, 290 P.U.R. 4th 261, 275.
[9] D.11-05-047, mimeo, at 18, 290 P.U.R. 4th 261, 272.

Beyond the flawed logic, SDCAN asserts that D. 11-05-047 did expressly contemplate the question of whether Section 739.9 applies to all customers or simply a class average in its reference to Water Code Section 80110(e). The Commission has interpreted the meaning of "up to 130%" in decisions addressing the Water Code. Second, in passing SB 695, the Legislature recognized a need to adjust policies imposed during the energy-crisis but it placed very strict parameters on those adjustments.[10] Commission cannot approve a rate increase that will impact Tier 1 and Tier 2 rates until the annual percentage change in the CPI from the past year is known.[11] Further, in Decision 09-12-048, the Commission determined it would require a Tier 2 advice letter filing for future rate adjustments to implement provisions of SB 695.[12] Part of the Commission's rational for its decision was the fact that "the rate changes will be different each year depending on the CPI."[13] Even if, arguendo, a customer charge was being proposed in accordance with Section 739.9, the Commission has already rejected this type of fixed customer charge because it "would be an unavoidable component of the bill of every residential customer, including those whose usage remained within baseline"[14] and thus cannot be avoided by a customer's reducing usage or being more energy efficient, showing that the charge offers no conservation price signal.[15]

C. TIERS SHOULD BE PRESERVED AND DIFFERENTIALS EXTENDED

SDCAN additionally opposes consolidating tiers or reducing tier differentials. SDCAN maintains that charging higher energy rates for higher usage customers is a key

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[10] 09/02/2009 Senate Floor Bill Analysis available at http://leginfo.ca.gov/pub/09-10/bill/sen/sb_0651-0700/sb_695_cfa_20090902_160903_sen_floor.html.

[11] See Cal. Pub. Util. Code Sec. 739.9 requiring the percentage change in the CPI from the prior year to be known

[12] D.09-12-048, mimeo, at p. 21.

[13] D.09-12-048, mimeo, at p. 21.

[14] D.11-05-047, mimeo, at p.33.

[15] D.11-05-047, mimeo, at p.33.

tool for sending conservation price signals. As will be discussed below, "dumbing-down" rate design by weakening price signals makes little sense in light of recently deployed Smart Grid and the need to give energy management companies the ability to assist consumers.

If the Commission adopts SDCAN's proposal to reject the proposed residential customer charge, the residential rate structure would remain unchanged compared to the present structure, reducing the need for further simplification. Multi-tiered pricing at the higher usage levels increases conservation incentives for those customers with the opportunity for reducing the greatest amount of load.[16] SDCAN's analysis indicates that these higher-usage customers tend to have higher incomes than customers with lower usage.[17] This analysis also shows 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.[18]

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. SDCAN's findings suggest that any proposal to consolidate tiers and reduce price signals for higher-usage customers 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.[19]

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[16] Id.

[17] Id.

[18] Attachment C p. 28-31

[19] Attachment C, p. 25-26, SDCAN developed illustrative rates that exclude a fixed customer charge and that maintain Tier 4 rates at a higher level than Tier 3 rates. For ease of comparison, these rates are revenue neutral with respect to SDG&E's proposal, reflecting a decrease in Schedule DR revenue of 1.3% compared with the current rate revenue and a decrease in Schedule DR-LI revenue of 0.9% compared with the current rate revenue.34 SDCAN's rate illustrations should not be viewed as an endorsement of these revenue changes but rather as a demonstration of how a revenue neutral rate can be designed consistent with SDCAN's recommendations. As shown in Table 10, under SDCAN's proposal Tier 1 energy charges for Schedule DR customers are increased relative to SDG&E's proposal by $0.011 per kWh to replace the revenue from SDG&E's proposed monthly customer charge. Consistent with DRA's proposal, Tier 4 rates are calculated so as to maintain the same $0.02 per kWh differential between Tier 3 and Tier 4 rates as in current rates. SDCAN's proposal maintains the same volumetric, four-tiered rate structure as used in current residential rates.

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.

Multi-tiered pricing is essential because it maximizes the rewards/incentives to those customers who most need the incentives to conserve – especially larger user of energy. To reduce the number of tiers and flatten the price differentials between the tiers results in sending a muted incentive to large residential users. Fewer tiers create a much more difficult challenge to users. Flattening the differentials between the tier blocks also destroys the rate incentives to conserve. Both multiple tiers and larger price differentials provide the incentives and rewards that users need to manage their energy consumption. Regardless of whether users respond to marginal or average price, SDG&E should not ignore what their customers – and how customers – should be rewarded for their conservation efforts. Flatter rates with fewer tiers cannot do that effectively.

Smart technologies will make tier pricing work far more effectively. Tier pricing hasn't been as effective as it could be because average pricing is easier for customers to access than marginal tier prices. Yet the average monthly price is not available to the customer until the end of the billing month. So at best, customers can respond to the average price in the previous month. However, with the advent of smart meter and communications technology, this capability now changes. Customers (and the third-party energy management companies) will be able to use real-time data to access marginal tier price data, to make decisions about monthly usage, e.g., when to operate appliances, etc., to forecast monthly consumption in real time and take advantage of the tier pricing incentives far more effectively. To abandon tier pricing exactly at the time that new technologies will allow customers to fully utilize this nonlinear pricing scheme is counterproductive.

D. RATE STRUCTURES MUST BE VOLUNTARY

SDCAN's proposed rate structure is voluntary/opt-in. SDCAN's position is based upon a very strongly held conclusion that residential customers will participate in real-time pricing if they see a benefit. They will resent real-time pricing if they view it as punitive. If a third-party energy management industry is permitted to develop, residential customers will gravitate towards this new rate structures in order to take advantage of the benefits and perquisites that the energy management companies will be offering.

SDCAN submits that involuntary imposition of new rate structures upon customers will result in winners and losers. The losers will be deeply resentful of the changes; the winners will likely be a small minority unless tier differentials and highly volumetric rates are preserved. In short, the Commission will doom real-time pricing to failure and public controversy if it doesn't create a rate structure that rewards utility customers and gives third-party energy managers the tools by which it can bestow those rewards upon residential customers.

II. HOW SDCAN's PROPOSED RATE DESIGN APPLIES THE PRINCIPLES

The Proposal Instructions request that parties explain how the proposed rate structure comports with each principle. SDCAN offers the following explanation:

1. Low-income and medical baseline customers should have access to enough electricity to ensure basic needs (such as health and comfort) are met at an affordable cost;

SDCAN's proposal contemplates the continuation of the low income and medical baseline programs. Moreover, by requiring affirmative opt-in to any TOU rate, low-income or vulnerable customers will be protected from potential rate shock caused by involuntary subscription into a TOU rate.

2. Rates should be based on marginal cost;

The proposed rates comport with the current rate structure in that tiered rates currently in place are marginal cost-based and any TOU rates implemented would also be cost-based. SDCAN recently settled a portion of A. 11-10-002 in which TOU rates were set at a cost-basis. That settlement is currently awaiting Commission action.

3. Rates should be based on cost-causation principles;

Cost causation is a concept akin to whether god exists and if the New York Yankees really were the Evil Empire to which Ronald Reagan referred in his 1983 speech. Its definition is easy; the application of the definition can occupy attorneys and theologians alike. SDCAN's application of this principle can be summarized thusly:

> Customers who change their consumption patterns to bring cost savings to the grid should receive a reward through incentive TOU rates. Customers who opt to maintain their current consumption should be subject to the current rate structure which penalizes high consumption customers based on a monthly average and rewards those who use few kWhrs each month. Those latter customers do not qualify for the savings available to customers who opt for incentive-based TOU rates.

4. Rates should encourage conservation and energy efficiency;

As discussed in great depth above, SDCAN's preservation of a highly differentiated tiered rate structure is key to encouraging both conservation and efficiency. Moreover, SDCAN's encouragement of energy management service providers further promotes both conservation and efficiency.

5. Rates should encourage reduction of both coincident and non-coincident peak demand;

As discussed previously in SDCAN's October 5, 2012 comments, encouraging reduction of coincident and non-coincident peak demand for residential customers is highly inappropriate as only a small percentage of residential (and small business) customers have demands that are large enough to impose a measureable cost upon the system. Moreover, the methodologies by which such demands would be measured and charged are very complex and will be prone to error given the load demand variety within the residential class. Nonetheless, the incentive TOU rates contemplated by SDCAN would assist in the reduction of peak demand.

6. Rates should be stable and understandable and provide customer choice;

SDCAN's approach toward achieving understandable choice is to rely upon third-party energy managers to advise and manage customers' consumption. SDCAN has long held that the majority of residential customers will not incur the transaction costs (search and information, bargaining and policing/enforcing costs) necessary to optimize TOU rates. Even if the Commission makes the rates "understandable", often times the potential savings do not justify the effort by an individual customer to analyze and adopt. The Commission should instead focus its efforts on ensuring that the new rate structures are understandable by customer proxies (energy managers/aggregators) and making them stable and diverse so that energy management infrastructure can mature.

7. Rates should generally avoid cross-subsidies, unless the cross-subsidies appropriately support explicit state policy goals;

SDCAN's rate structure doesn't create cross-subsidies other than those that address the needs of low-income or medically vulnerable customers. They largely mirror existing rate structures. Those who claim that current rates are skewed by cross-subsidies have not put forth persuasive arguments that quantify such cross-subsidies.

8. Incentives should be explicit and transparent;

See discussion above

9. Rates should encourage economically efficient decision-making;

See discussion above

10. Transitions to new rate structures should emphasize customer education and outreach that enhances customer understanding and acceptance of new rates, and minimizes and appropriately considers the bill impacts associated with such transitions.

As discussed above in greater depth, SDCAN's focus is on creating incentive TOU rates that can be utilized by customer proxies who have the expertise and economic interests in optimizing their customers' energy consumption patterns. They should be the object of the Commission's rate design efforts.

III. IMPACT UPON NET ENERGY METERING

SDCAN's proposed rate structure does not change net metering arrangements. SDCAN believes that net metering is a beneficial arrangement that promotes the adoption of distributed PV. Current efforts to quantify system costs and benefits attributable to distributed PV will help shape any future rate design efforts. However, in the absence of such information, the Commission is not in a position to change its approach towards net metering.

IV. IMPACT ON LOW-INCOME AND MEDICALLY VULNERABLE CUSTOMERS

As discussed above in response to the principles, SDCAN's proposal contemplates the continuation of the low income and medical baseline programs. Moreover, by requiring affirmative opt-in to any TOU rate, low-income or vulnerable customers will be protected from potential rate shock caused by involuntary subscription into a TOU rate.

V. THE UNINTENDED CONSEQUENCES THAT MAY RESULT FROM THIS PROPOSED RATE STRUCTURE.

This is a particularly appropriate question in light of the reality that "the road to hell is paved with good intentions". SDCAN's thinking on this question is shaped heavily by the recent academic analyses contained in Attachments A & B. It led SDCAN to propose an incremental, incentive-based rate structure that rewards customers who are interested in changing consumption patterns to reflect costs but does not punish those for whom the transaction costs exceed expected benefits. SDCAN offers three unintended consequences:

- Customers may not respond as expected;
- The likely elimination of the afternoon summer peak will confound customers; and
- Other benefits of marginal pricing will be lost

A. Customers May Not Respond As Expected

SDCAN has included two attachments to its submission. They are both recent academic investigations into customer responsiveness to electricity price signals. They both challenge conventional wisdom about residential customer price elasticity and responsiveness. The Ito paper is a very controversial one and one with which SDCAN doesn't necessary agree. Its analysis contains some questionable assumptions, including:

- The fact that Professor Ito[20] assumes perfect price information then resorts to average price because it is untrue suggests there is a major flaw in the assumptions associated with access to multi-tier structure data;
- The assumption of zero cost of knowing the nonlinear price structure biases the marginal price case; Ito does address uncertainty regarding which tier on the nonlinear schedule the consumers faces;
- The average price is not known in advance; it can only be calculated after the fact; a lagged average price approach would be superior to this more theoretical construct to better reflect reality. The assumption that where a consumer does not or cannot know the price in advance of the decision to consume electricity or any other product or service, then one can still assert a causal relationship between price and consumption.
- Summer and winter models might alter the response estimate, especially for the summer months; there is a much greater incentive to know and respond to summer rates than to winter rates.
- The progressive tax system is a flawed analogy since progressive tax rates are "step" not block rates; step rates charge all usage at the same rate; block rate charge only usage in the block at that rate.
- The absence of transaction costs. Specifically, Professor Ito assumes that customers are aware of the nonlinear price schedule in the first two scenarios at zero cost of obtaining that information and only the usage parameter may be subject to uncertainty in the second scenario (marginal price versus expected marginal price). In the third scenario, the average price is substituted as a proxy based on the cost of obtaining the nonlinear price schedule and prices.

Notwithstanding these analytical defects, Professor Ito does raise a very useful point: commonly-held assumptions may not be accurate. His suggestion that marginal pricing does not promote conservation deserves analysis. Professor Allcott examined a

[20] Koichiro Ito was a postdoctoral fellow when he authored this paper. He later joined Boston University faculty as a professor.

similar question: will residential customers respond to real-time pricing? He found that consumers did respond but did not increase average consumption during off-peak times, i.e. they conserved rather than shifted consumption. And their response was surprisingly modest; he estimated approximately 1-2% of a household's total electricity costs. He found that self-selecting households who chose to participate in a real-time pricing program demonstrated some, although not significant, consumption elasticity. Professor Alcott acknowledges that an eight-month experience is not ideal evidence on how households would respond to real-time pricing over a period of years; he acknowledges that no reliable prediction currently exists we are, undeniably, in uncharted waters. Any modifications to rate design made by the Commission will be subjecting over 30 million people to a large economic experiment.

These two studies shaped SDCAN's approach to the incremental, incentive-based rate structure that rewards customers who are interested in changing consumption patterns to reflect costs but does not punish those for whom the transaction costs exceed expected benefits. For example, Professor Allcott found the annualized value of the Chicago residential customers' consumption changes amounted to only $10 – this would not be enough to overcome the vast majority of households' transaction costs in choosing amongst various real-time pricing offerings.

B. The Likely Elimination of the Summer Peak Will Confound Customers

The Commission has been overly focused upon time-of-use pricing on the basis that accurate pricing of expensive peak power will reduce peak demand and lead to lower overall prices. This scenario may be accurate today. It will more likely not be accurate when time-of-use pricing is widely implemented.

SDCAN submits that what little that customers know today about when to use power will be wrong in the near future. For example, current TOU pricing communicates to customers that they should avoid using power during the mid-afternoon and, instead, to use power after 7pm. The exact opposite may become true in the coming years. SDCAN has already observed peak getting later because of increased residential air conditioning saturation High PV penetration reduces peak a few percent and shifts peak on rest of system to hour ending 7 or 8 pm. Distribution peak in residential areas is already ending at 7 or 8 pm, so PV now doesn't reduce residential distribution peak.

Moreover, a daily ramp from minimum to peak on a summer day is reduced slightly but concentrated in time to a fairly robust ramp from 5 to 7 pm.

The Commission should proceed with an expectation that ramping energy is likely to be much more expensive while commodity energy is likely to be less expensive due to solar penetration. Within five years, SDCAN expects that the peak period will likely be span from 5:00 to 9:00 or 10:00pm for close to 365 days a year, with secondary peak occurring in early morning hours. The result is that customers will need to respond both to new peak period and to very cheap power mid-day. This likely scenario heightens the scenario that residential customers will have difficulty adjusting to changing load shapes unless there is a professional energy management infrastructure in place to manage residential customer consumption.

C. Marginal Pricing Benefits Will Be Lost

Another very real possibility for unintended consequences is the fact that even if customers do respond to average price, as theorized by Professor Ito, prices have other uses than demand response. While they are designed to provide incentives for customers to respond for purposes of conservation, they are also designed to recover revenues in alignment with costs where possible. Where the larger consumers cost more to serve than the smaller consumers, then the multiple-tier price structure serves the purpose of tracking costs better than flat rates. Furthermore, if the tier price faced by a consumer for whom that tier is marginal reduced usage by one kWh, it is most ideal if the bill savings is equivalent to or at least approximates the cost savings at the margin. Flat rates do not have the same cost-tracking flexibility for customers of different sizes.

So even if Professor Ito is correct and consumers respond to average prices, the amount of savings they should receive should reflect the avoided or marginal costs they cause by their actions. If a multi-tier, TOU or a dynamic rate structure facilitates that, then a nonlinear rate design is preferable to a flat linear design. Removing tiers only serves to reduce the flexibility of the rate analyst to track costs in the rate design. Professor Ito's single-minded pursuit of customer responsiveness is limited to the consumer response to marginal prices in nonlinear (multi-tier) rate structures. But ignoring customer charges, tiered rates collect more revenue per kWh from large consumers than from small consumers. Tiered rates are also noteworthy for the savings

yield per kWh at the margin when these consumers do conserve. So if marginal prices are or can be made to be effective through the use of smart meters and communications technologies, then tiered rate designs can offer a more targeted conservation effort.

But whatever consumers respond to, and however much they respond, the tier at which each consumer is marginally priced represents the amount of bill savings they will see. Those savings should attempt to reflect the marginal or avoided costs to the utility and so tiered pricing retains value still in terms of the savings it offers the customer even if not the ability to cause a sufficient conservation response.

VI. INNOVATIVE TECHNOLOGIES AND SERVICES AVAILABILITY

SDCAN is very appreciative that the Commission is asking this question of parties as it is a central one. SDCAN's basic thesis advanced in this submission is that the innovative technologies and services are the linchpin to residential adoption of real-time pricing. SDCAN's monitoring of the marketplace suggests that the innovations are coming but will not be mass-produced or widely available until such time as an energy management infrastructure develops. A number of large companies have expressed interest in serving this market, but they haven't seen the opportunity develop. No doubt, they are watching California's steps towards more incentive pricing that could result in savings for customers who might subscribe to such services. But this market place should not be confused with a Field of Dreams; if the field is not built correctly, they won't come to California. While the interest exists, the hardware is in its infant stages. Currently, the number and breadth of in-home devices that interact with smart meters is very limited.[21] However, current availability only indicates that the market is emerging; it has little bearing on the question of whether such innovative technologies are coming.

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[21] SCE's website indicates that it has tested six devices that are compatible with its meters. https://www.sce.com/wps/portal/home/customer-service/my-account/smart-meters/han-faq/!ut/p/b1/hc-xDoIwGATgR-pJsYWxatNWkVpLELsYBmMwAg7G5xcTHYxR_u2S7y75SSAVCV19b071rem7-vLMgR0miRLaeBi7lSkM985HckGtnw5gPwD8OIGx_o6ET5KsaAwzi2Vh5xE4o18gK_kAlHflpoTO-AhYvxdSBamXFkYVjsJQh9wLQQH2An--yHXfHsm1rdCYc_wAvrjTRg!!/dl4/d5/L2dBISEvZ0FBIS9nQSEh/#/faq-HAN Devices5/faq-HAN Devices1/faq-HAN Devices8

Footnote continued on next page

McKinsey published a 2011 report in which it stated that it does not expect truly disruptive technologies to boom over the next ten years and lead the way to the low-energy home of the future. The pace at which a wide range of relatively mature and emerging technologies develop and become commercially viable will therefore determine the critical level of consumer adoption. That in turn would enable production at scale, further reducing costs and paving the way for mass adoption.[22]

It noted that many technologies already recoup their investments today, sometimes with regulatory support, including heat pumps, double- and triple-glazed windows, energy-efficient lighting, and microgeneration products (such as solar panels). Other technologies have a largely unexploited potential, most notably heating, ventilation, and air-conditioning systems using occupancy sensors that automatically manage when and where heating and air conditioning are applied. Still other technologies, now under development, have a huge potential and could be commercially viable by the end of the decade. One example is "active windows" with coatings that block incoming light when temperatures are high. They could recoup investments in less than three years when installed in new homes. SDCAN also notes that LED lighting technologies are beginning to evidence economy of scale. So technology will not be the obstacle to the emergence of an energy management marketplace.

SDCAN posits that whether rate design will sufficiently reward customers who use energy management will be the determinative factor of the industry's growth. As discussed throughout this submission, SDCAN strongly urges the Commission to incorporate the observations of the energy management industry in shaping its rate structure.

SDG&E indicates that it has tested and approved three devices, none of which are sold through retail stores. http://www.sdge.com/newsroom/press-releases/2013-01-09/sdge-customers-can-connect-home-area-network-devices-smart-meters

[22]http://www.mckinsey.com/insights/energy_resources_materials/winning_the_battle_for_the_home_of_the_future

VII. TRANSITION TO NEW RATE STRUCTURES

In the discussion above, SDCAN explains how the transition must be voluntary, incremental, reward-based, encouraging of a third-party energy management infrastructure to develop the education and hardware availability. SDCAN does not envision a scenario in which TOU rates should be imposed upon residential customers. Nor does it subscribe to an opt-out arrangement which largely punishes the unaware. Rate design reform should done for the customer, not done to the customer.

VIII. LEGAL BARRIERS

As discussed above, there are definite legal barriers to the imposition of fixed charges in rates. This discussion won't be repeated here. SDCAN has offered a rate proposal that does not fall afoul of any current laws.

IX. ADAPTION TO CHANGING LOAD SHAPES

The importance of relying upon the development of an energy management infrastructure to serve residential customers is highlighted by anticipated changes in load shape. As discussed above in the "Unintended Consequences" section, SDCAN has advanced the proposition that the current afternoon peak to which customers have become accustomed could very soon become an early evening and early morning peak with some of the cheapest power available during the late afternoon. In short, everything that customers know about peak power pricing will be turned on its head when TOU pricing becomes fully integrated into rate structures. Customer confusion will be substantial and will be accompanied by frustration. No amount of customer education will prepare residential customers for the Alice-in-Wonderland gyrations to peak pricing that are forthcoming. For this reason, TOU pricing will need to be fluid and will have to be geared to ensuring that residential energy management providers can respond to changes without disrupting their customers' consumption patterns. SDCAN's proposed rate structure is designed specifically to address this very challenging scenario.

X. PUBLIC SAFETY

SDCAN submits that there is a direct correlation between safety and customer acceptance and understanding of price signals. The scenarios we all dread are the ones involving vulnerable customers who imperil themselves and other by refraining from using energy out of fear exceeding their fixed budgets. For example when pensioner Australian Wendy Bennett-Teague received a $1000 bill for two months of consumption due to unexplained consumption during peak periods, she was flummoxed. As her daughter laying dying of terminal cancer, Ms. Bennett-Teague has been forced to disconnect most of the home's heating devices while the utility and other local electricians futilely seek the cause of the abnormally high peak consumption in her 7-year-old home.[23] The parade of horribles that lurk in darker shadows are customers seeking to avoid triggering unanticipated bill impacts by jury-rigging electrical equipment, modifying appliances or installing inappropriate or untested devices on the network. All of these desperate or informed measures increase the risk to public safety. Customers' inability to anticipate their monthly energy bill or their inability to avoid punitive prices is likely to be the greatest danger posed by poorly constructed rate designs.

The proposed rate structure advanced by SDCAN protects consumers from punitive pricing and increases the likelihood that those who do subscribe to incentive rate plans will be served by an energy management service that stands behind the commitment to reap benefits.

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[23] http://au.news.yahoo.com/today-tonight/money/bills/article/-/14154705/power-bill-horror-stories/

CONCLUSION

SDCAN appreciates the opportunity to provide the proposed rate structure in this rulemaking proceeding. SDCAN hopes that the discussion above assists the Commission in shaping future rates.

Respectfully submitted, Dated: May 29, 2013

/s/

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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.
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ATTACHMENT B

RETHINKING REAL-TIME ELECTRICITY PRICING

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Rethinking real-time electricity pricing

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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.

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 literature[1] 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.

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[1] The earliest peak load pricing discussion dates to Houthakker (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).

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ATTACHMENT C

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 (C EC) 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).

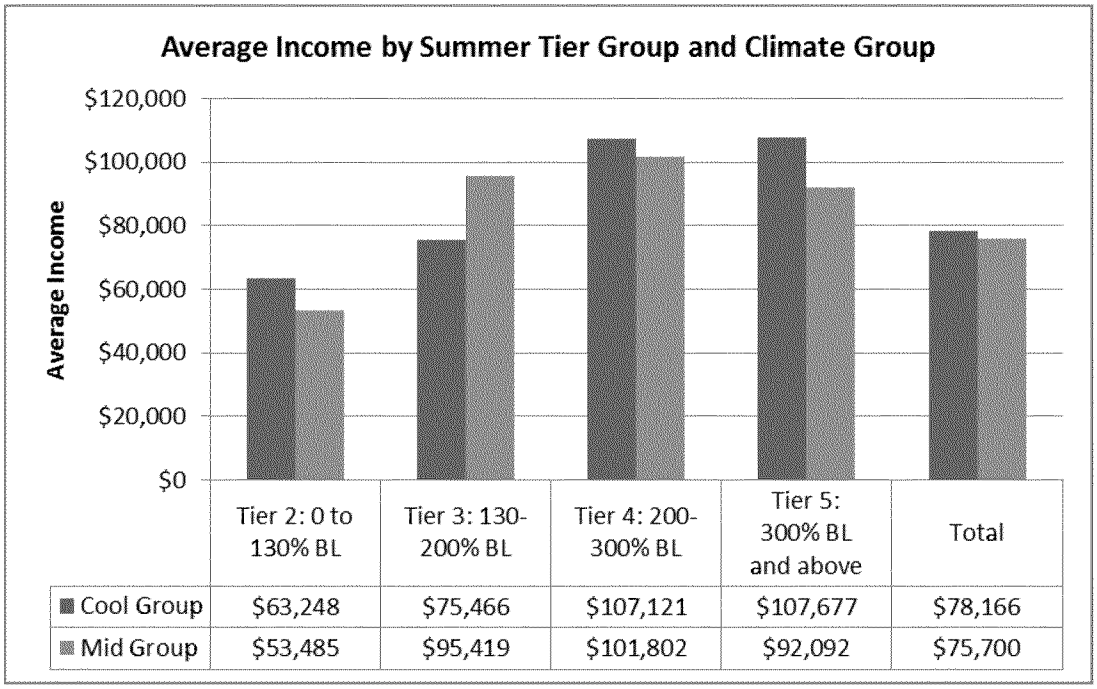
We cross-tabulated and analyzed income by tier grouping, and by whether customers were single-family and multi-family in each of the climate zones. We also analyzed the saturation of central air conditioning and swimming pools by income and by tier grouping and analyzed the relationship of the square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

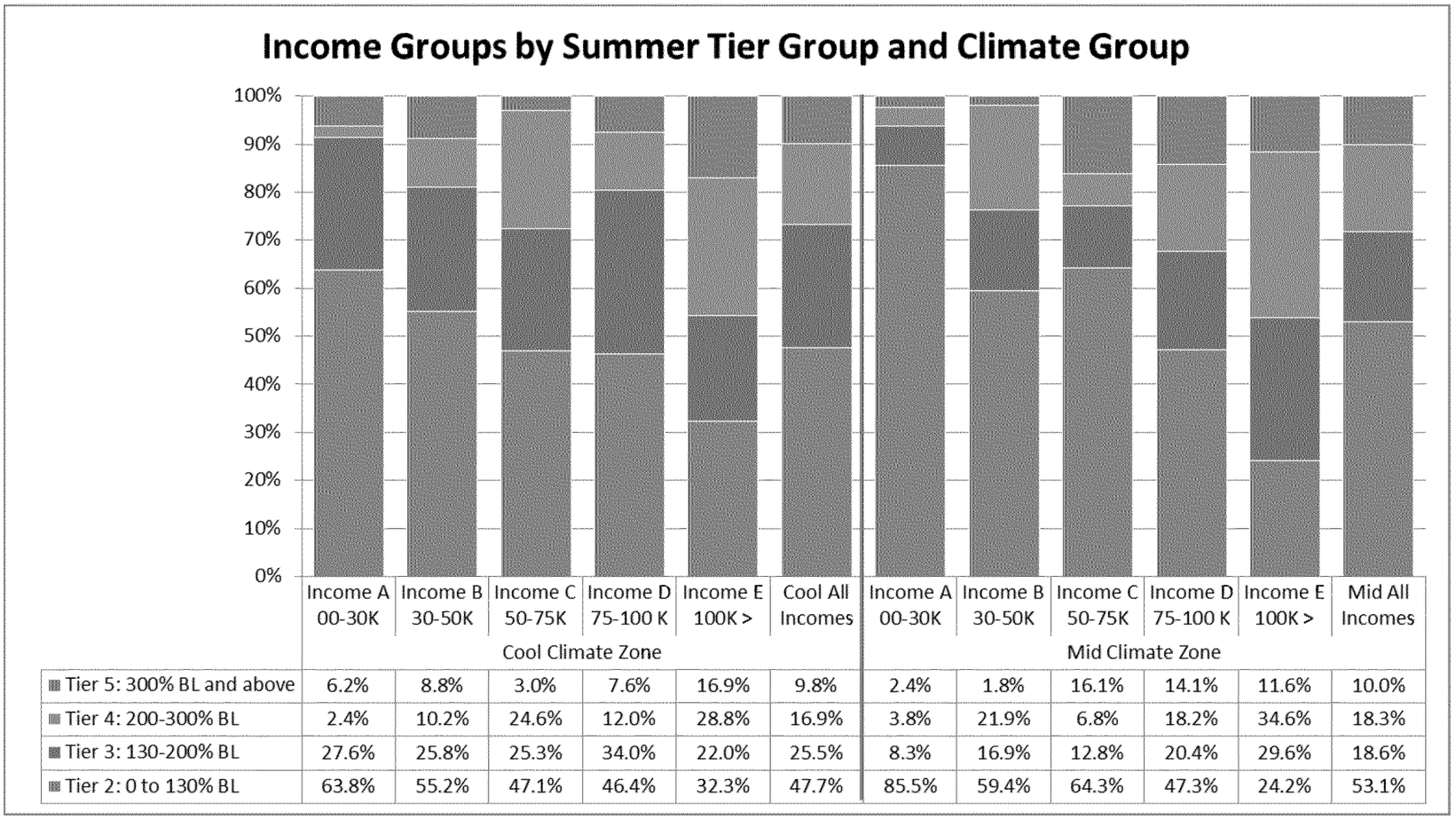
Figure 1: Average Income by Summer Tier Group and Climate Group



	Tier 2: 0 to 130% BL	Tier 3: 130-200% BL	Tier 4: 200-300% BL	Tier 5: 300% BL and above	Total
Cool Group	$63,248	$75,466	$107,121	$107,677	$78,166
Mid Group	$53,485	$95,419	$101,802	$92,092	$75,700

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



	Income A 00-30K	Income B 30-50K	Income C 50-75K	Income D 75-100 K	Income E 100K >	Cool All Incomes	Income A 00-30K	Income B 30-50K	Income C 50-75K	Income D 75-100 K	Income E 100K >	Mid All Incomes
	Cool Climate Zone						Mid Climate Zone					
Tier 5: 300% BL and above	6.2%	8.8%	3.0%	7.6%	16.9%	9.8%	2.4%	1.8%	16.1%	14.1%	11.6%	10.0%
Tier 4: 200-300% BL	2.4%	10.2%	24.6%	12.0%	28.8%	16.9%	3.8%	21.9%	6.8%	18.2%	34.6%	18.3%
Tier 3: 130-200% BL	27.6%	25.8%	25.3%	34.0%	22.0%	25.5%	8.3%	16.9%	12.8%	20.4%	29.6%	18.6%
Tier 2: 0 to 130% BL	63.8%	55.2%	47.1%	46.4%	32.3%	47.7%	85.5%	59.4%	64.3%	47.3%	24.2%	53.1%

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

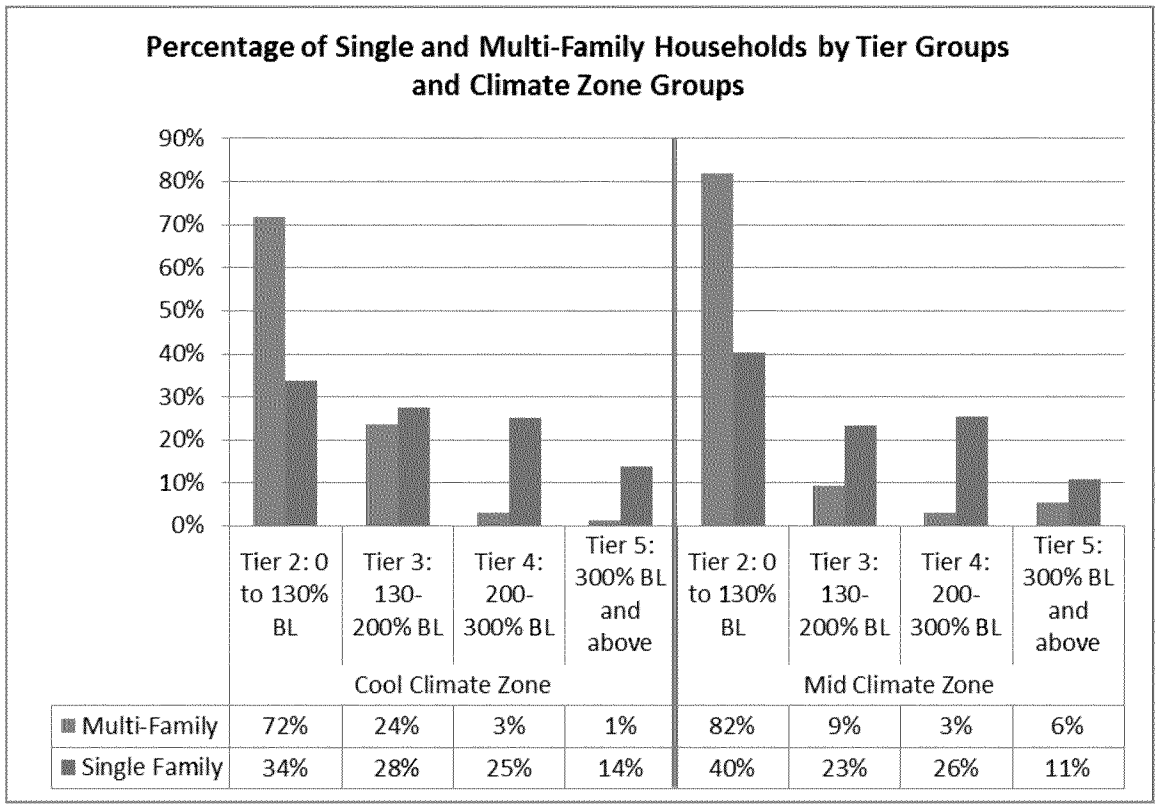
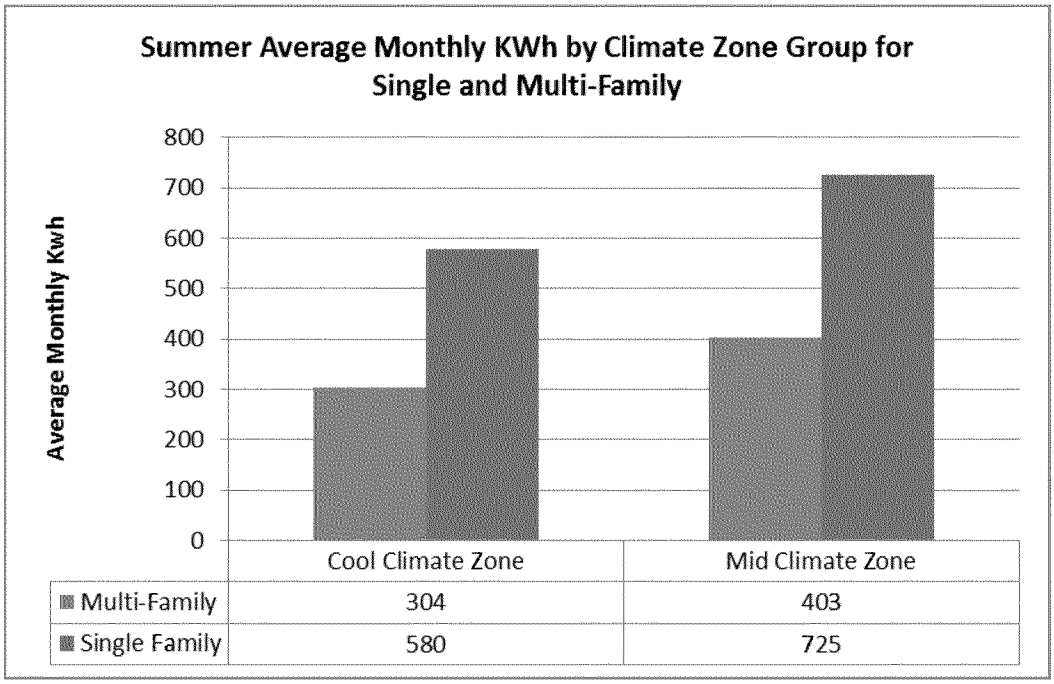


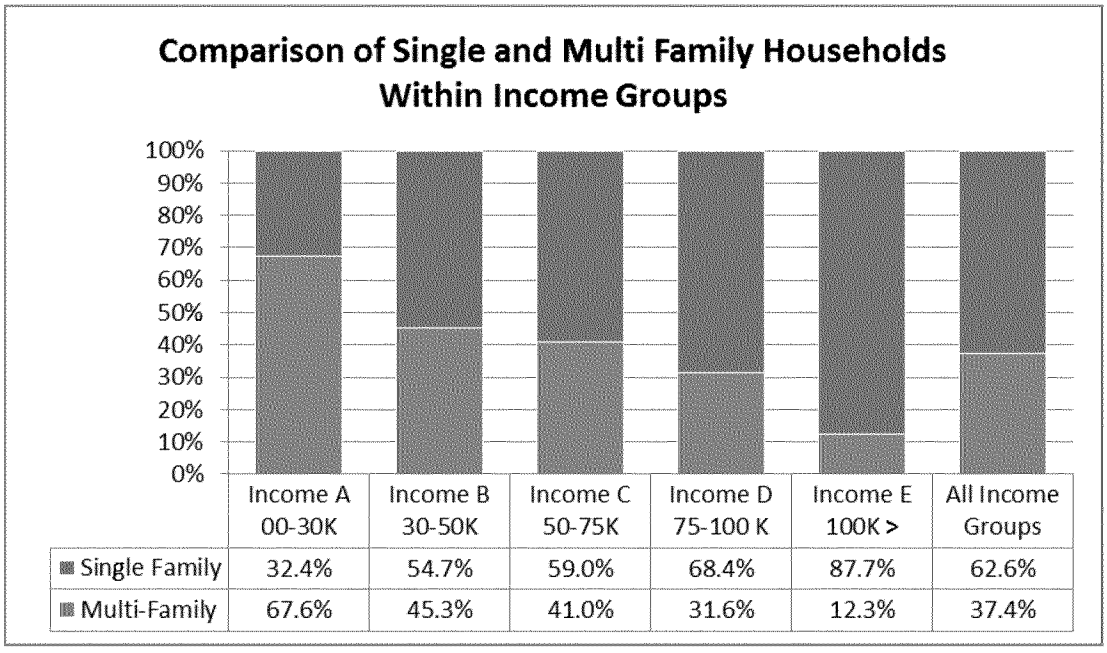
Figure 4: Summer Average Monthly Kwh by Single-Family and Multi-Family Households



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.

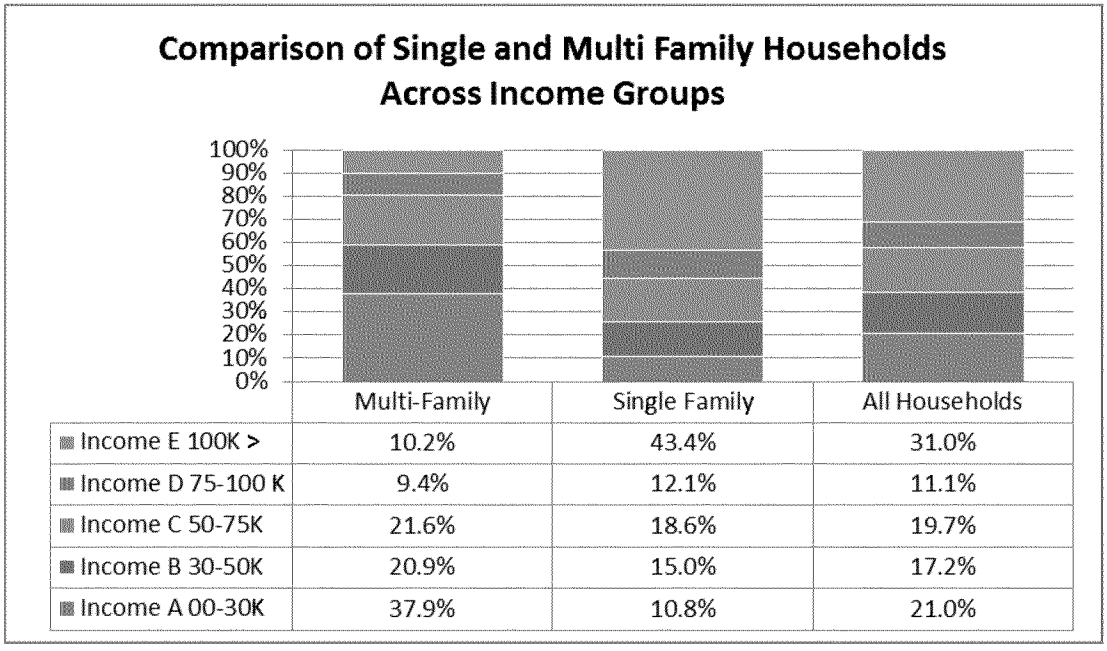
There also are large differences in income between single-family and multi-family dwellers. While a majority of households in all income groups live in single-family dwellings in SDG&E's service area as a whole, the proportion rises from 32% to 87% as income rises.

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



	Income A 00-30K	Income B 30-50K	Income C 50-75K	Income D 75-100 K	Income E 100K >	All Income Groups
Single Family	32.4%	54.7%	59.0%	68.4%	87.7%	62.6%
Multi-Family	67.6%	45.3%	41.0%	31.6%	12.3%	37.4%

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



	Multi-Family	Single Family	All Households
Income E 100K >	10.2%	43.4%	31.0%
Income D 75-100 K	9.4%	12.1%	11.1%
Income C 50-75K	21.6%	18.6%	19.7%
Income B 30-50K	20.9%	15.0%	17.2%
Income A 00-30K	37.9%	10.8%	21.0%

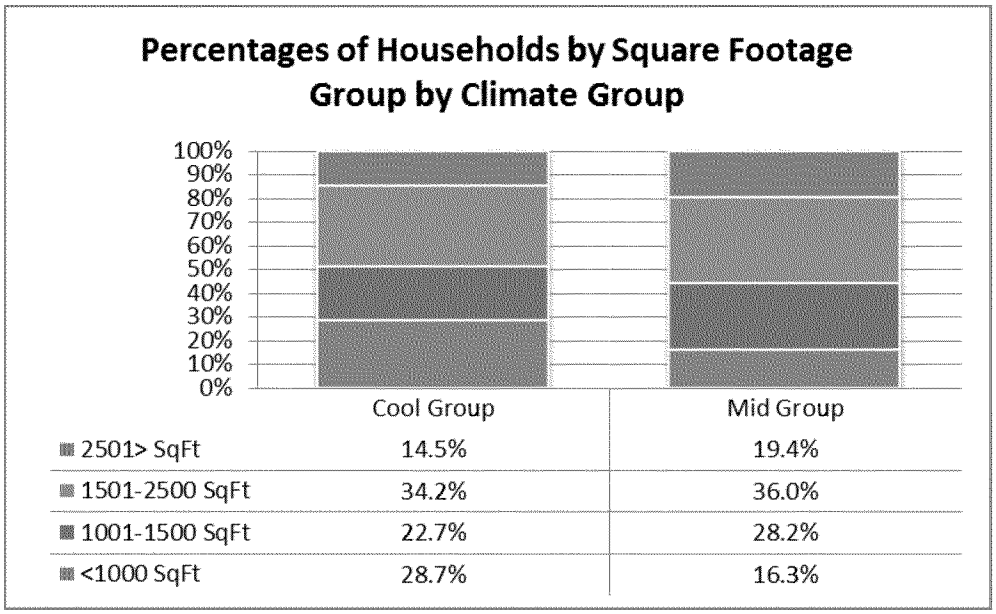
On the SDG&E system as a whole, 55% of single-family dwellers earned more than $75,000, compared to 20% of multi-family households. Both climate zones showed a

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

3. Square Footage

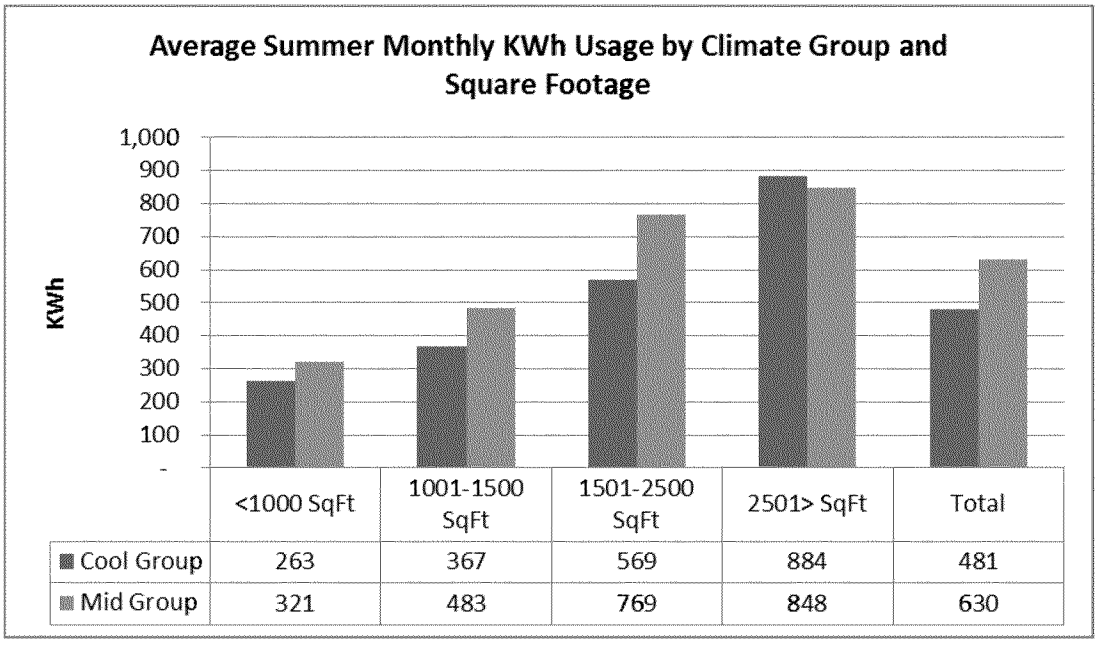
Figure 7 shows the percentage of dwellings by square footage. The more urbanized cool area has more dwellings under 1500 square feet than the suburban inland area.

Figure 7: Percent of Households by Square Footage



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

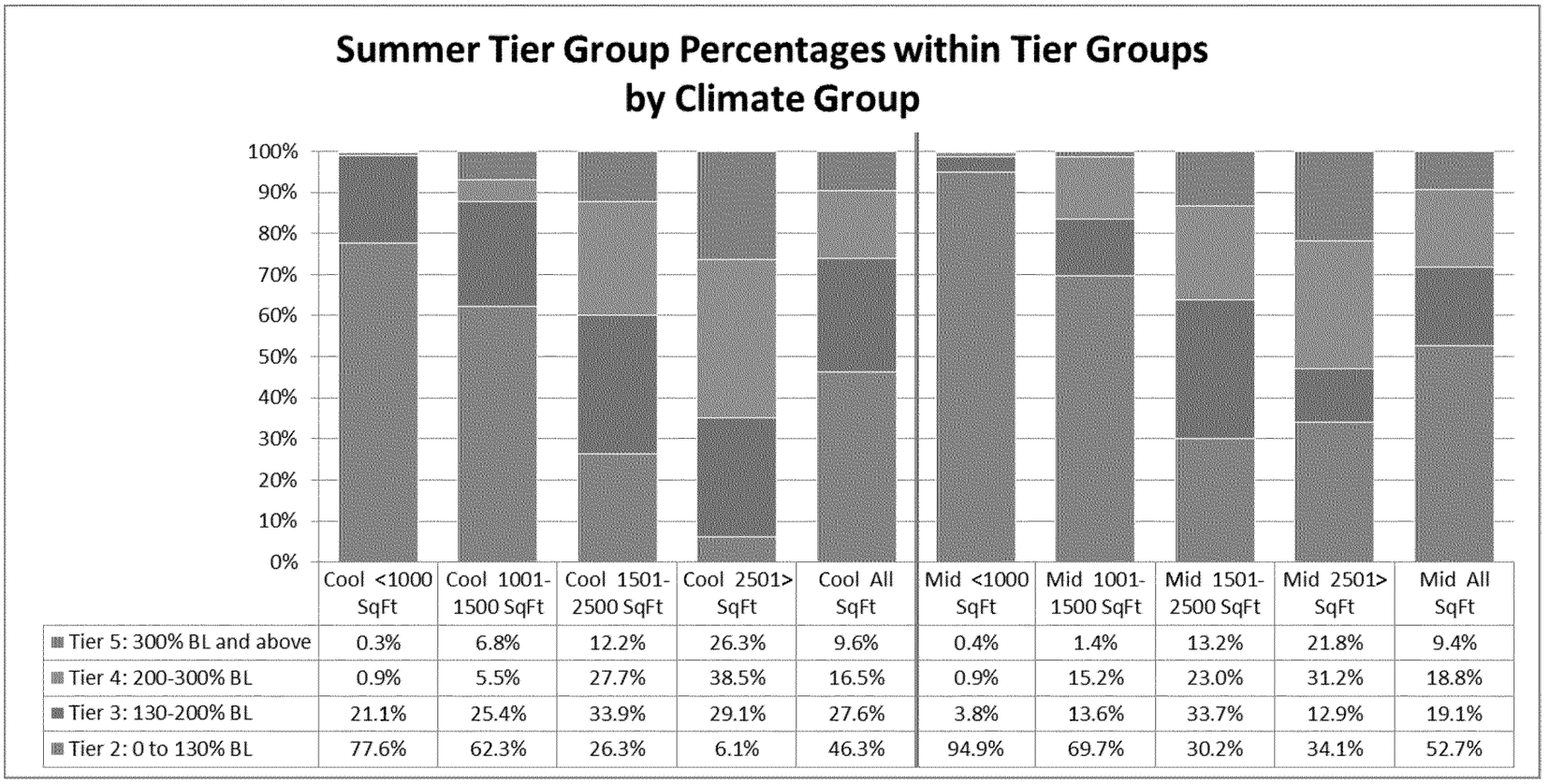
Figure 8: Average Summer Monthly KWh Usage by Climate Group and Square Footage SDGE



	<1000 SqFt	1001-1500 SqFt	1501-2500 SqFt	2501> SqFt	Total
Cool Group	263	367	569	884	481
Mid Group	321	483	769	848	630

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.

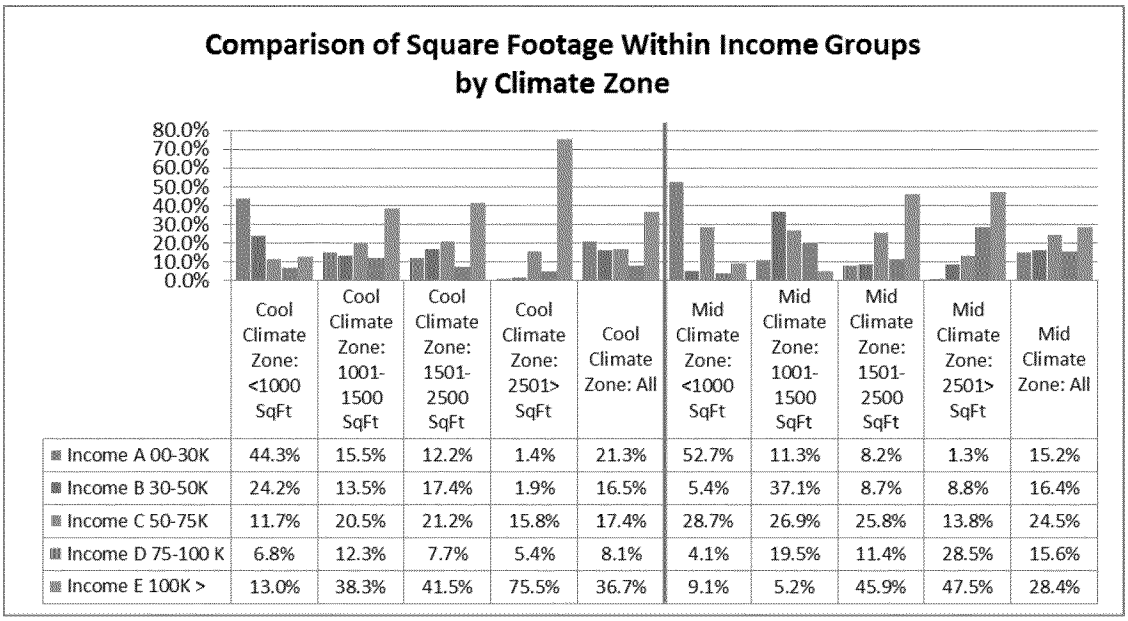
Figure 9: Percentage in Tiers 2-5 (Average Summer Monthly Use) by Square Footage of Dwelling SDGE



	Cool <1000 SqFt	Cool 1001-1500 SqFt	Cool 1501-2500 SqFt	Cool 2501> SqFt	Cool All SqFt	Mid <1000 SqFt	Mid 1001-1500 SqFt	Mid 1501-2500 SqFt	Mid 2501> SqFt	Mid All SqFt
Tier 5: 300% BL and above	0.3%	6.8%	12.2%	26.3%	9.6%	0.4%	1.4%	13.2%	21.8%	9.4%
Tier 4: 200-300% BL	0.9%	5.5%	27.7%	38.5%	16.5%	0.9%	15.2%	23.0%	31.2%	18.8%
Tier 3: 130-200% BL	21.1%	25.4%	33.9%	29.1%	27.6%	3.8%	13.6%	33.7%	12.9%	19.1%
Tier 2: 0 to 130% BL	77.6%	62.3%	26.3%	6.1%	46.3%	94.9%	69.7%	30.2%	34.1%	52.7%

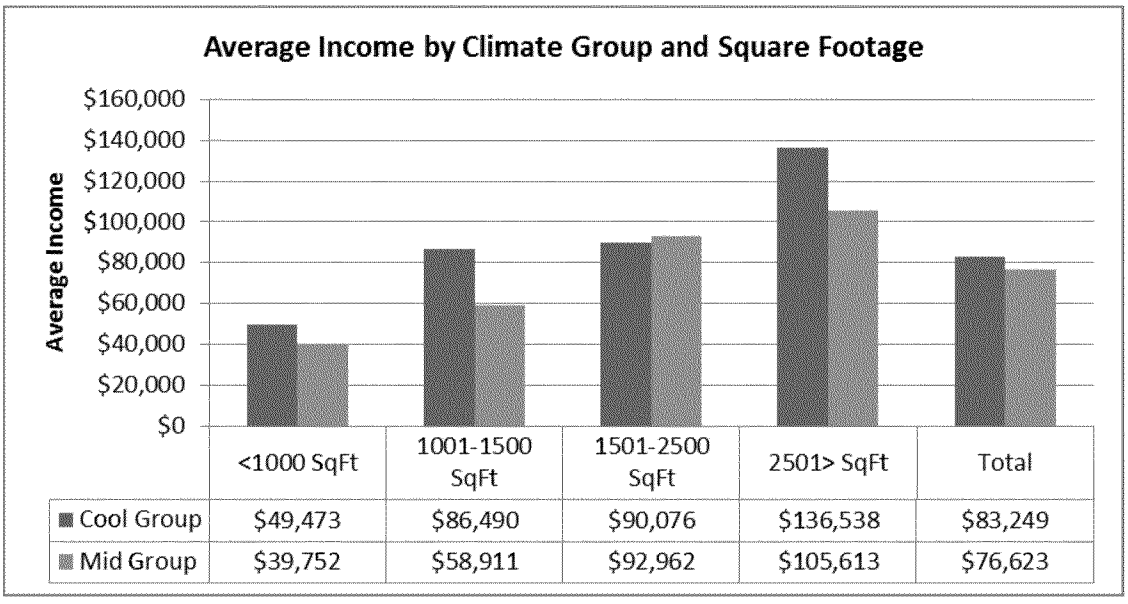
There is a strong correlation between square footage of dwellings and income. Of those in dwellings over 2500 square feet, 47 to 75% (depending on climate zone) earned more than $100,000. Very few people earning over $100,000 lived in dwellings under 1,000 square feet – 13% in the more urbanized cool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

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



	Cool Climate Zone: <1000 SqFt	Cool Climate Zone: 1001-1500 SqFt	Cool Climate Zone: 1501-2500 SqFt	Cool Climate Zone: 2501> SqFt	Cool Climate Zone: All	Mid Climate Zone: <1000 SqFt	Mid Climate Zone: 1001-1500 SqFt	Mid Climate Zone: 1501-2500 SqFt	Mid Climate Zone: 2501> SqFt	Mid Climate Zone: All
Income A 00-30K	44.3%	15.5%	12.2%	1.4%	21.3%	52.7%	11.3%	8.2%	1.3%	15.2%
Income B 30-50K	24.2%	13.5%	17.4%	1.9%	16.5%	5.4%	37.1%	8.7%	8.8%	16.4%
Income C 50-75K	11.7%	20.5%	21.2%	15.8%	17.4%	28.7%	26.9%	25.8%	13.8%	24.5%
Income D 75-100 K	6.8%	12.3%	7.7%	5.4%	8.1%	4.1%	19.5%	11.4%	28.5%	15.6%
Income E 100K >	13.0%	38.3%	41.5%	75.5%	36.7%	9.1%	5.2%	45.9%	47.5%	28.4%

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



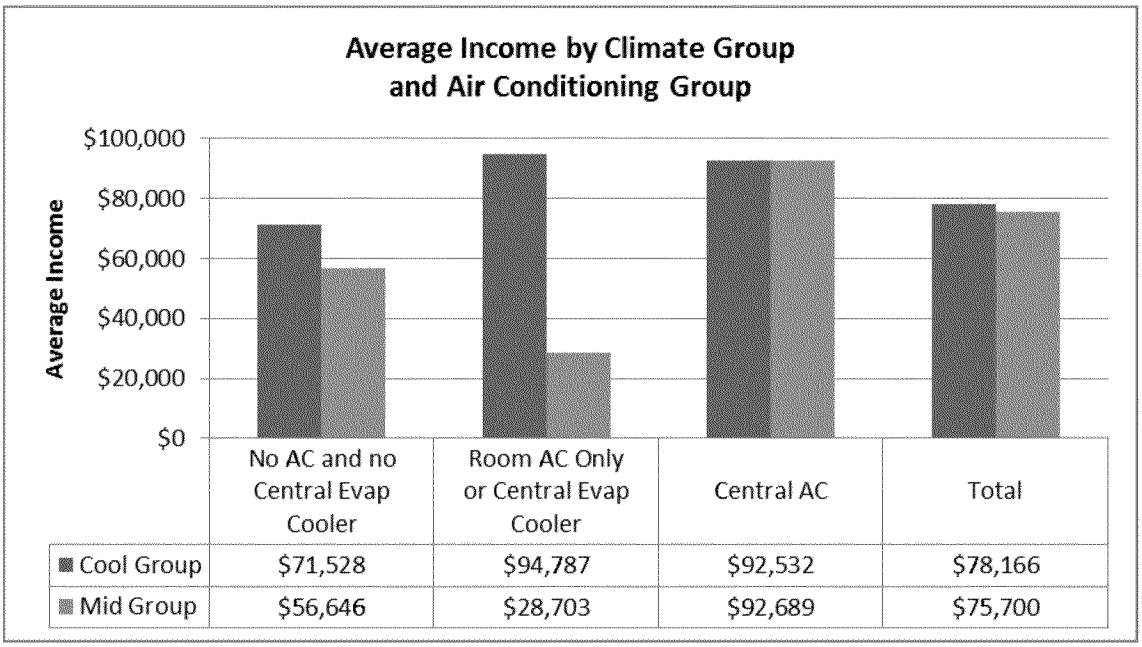
	<1000 SqFt	1001-1500 SqFt	1501-2500 SqFt	2501> SqFt	Total
Cool Group	$49,473	$86,490	$90,076	$136,538	$83,249
Mid Group	$39,752	$58,911	$92,962	$105,613	$76,623

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.

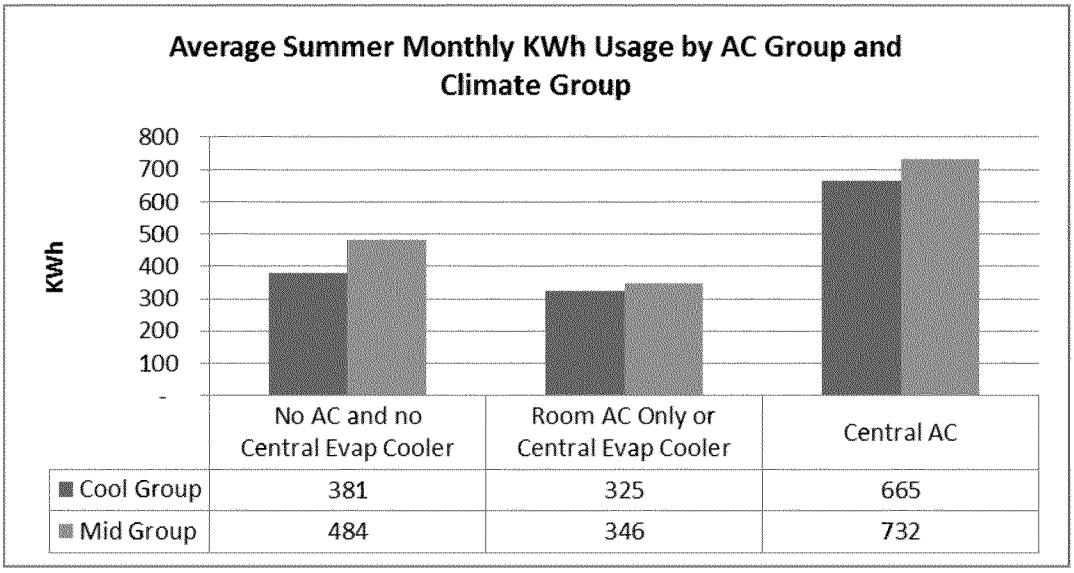
Figure 12: Average Income by Air Conditioner Type and Climate Group SDGE



	No AC and no Central Evap Cooler	Room AC Only or Central Evap Cooler	Central AC	Total
Cool Group	$71,528	$94,787	$92,532	$78,166
Mid Group	$56,646	$28,703	$92,689	$75,700

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

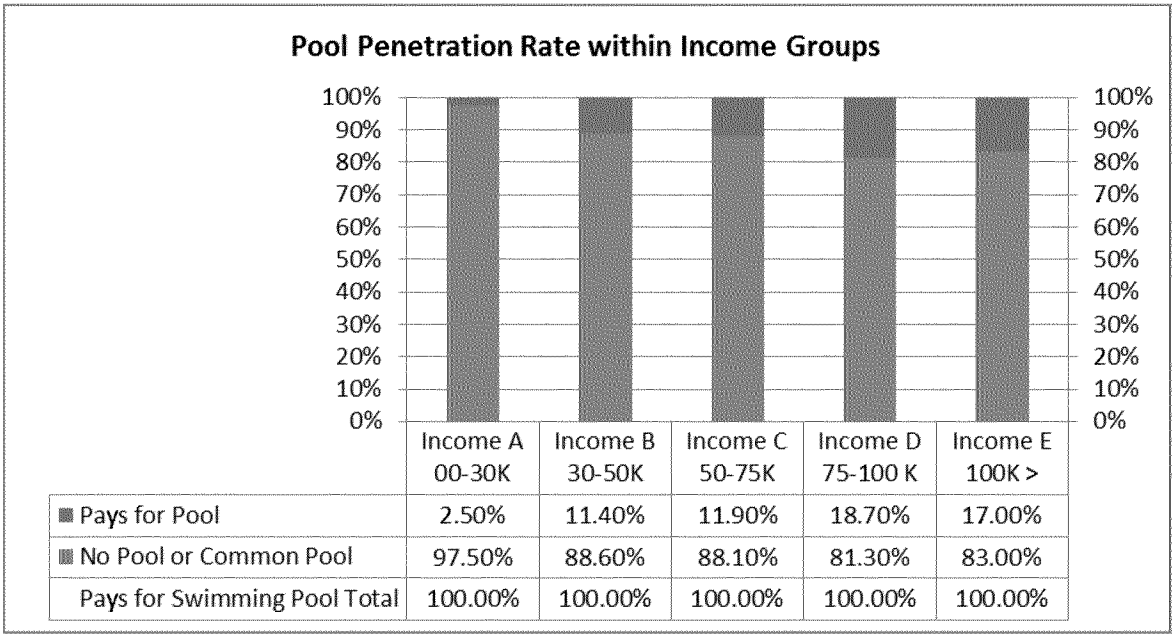


	No AC and no Central Evap Cooler	Room AC Only or Central Evap Cooler	Central AC
Cool Group	381	325	665
Mid Group	484	346	732

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.

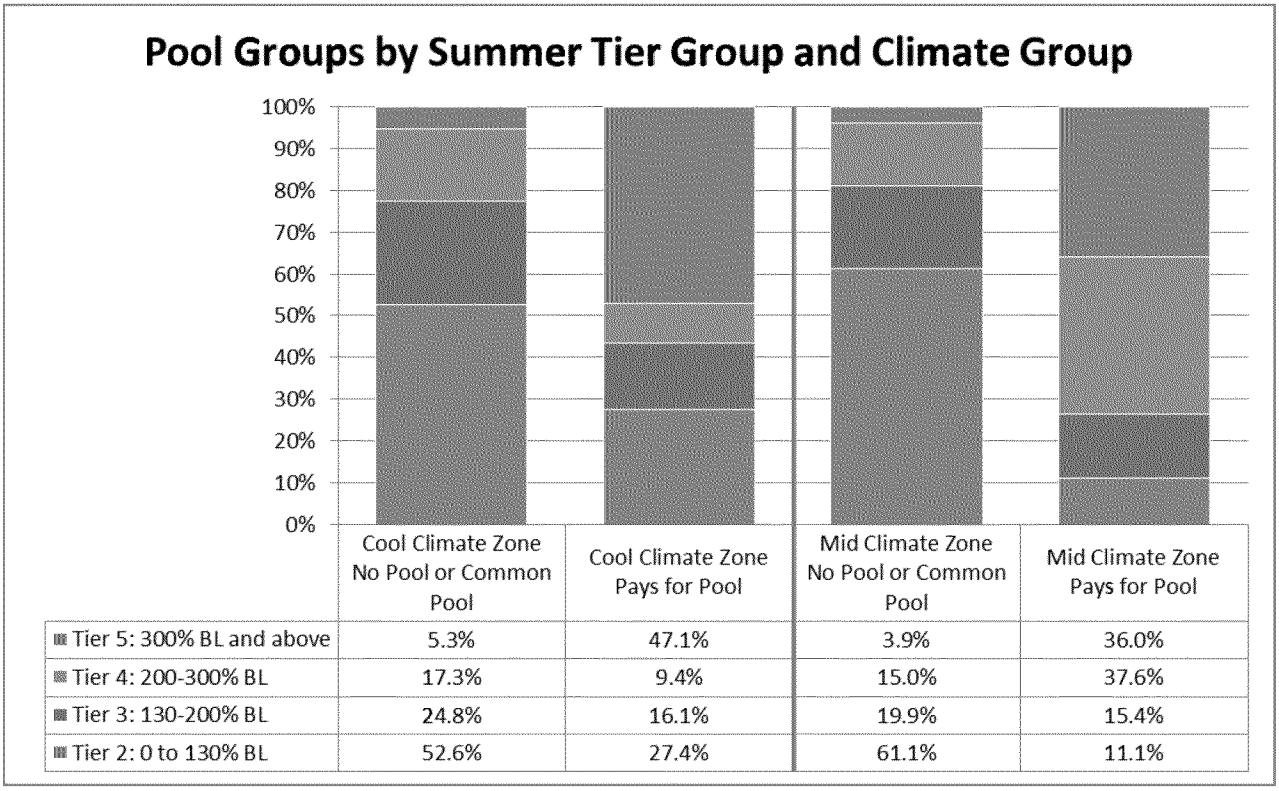
Figure 14: Pool Ownership across Income Groups SDGE



	Income A 00-30K	Income B 30-50K	Income C 50-75K	Income D 75-100 K	Income E 100K >
Pays for Pool	2.50%	11.40%	11.90%	18.70%	17.00%
No Pool or Common Pool	97.50%	88.60%	88.10%	81.30%	83.00%
Pays for Swimming Pool Total	100.00%	100.00%	100.00%	100.00%	100.00%

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.

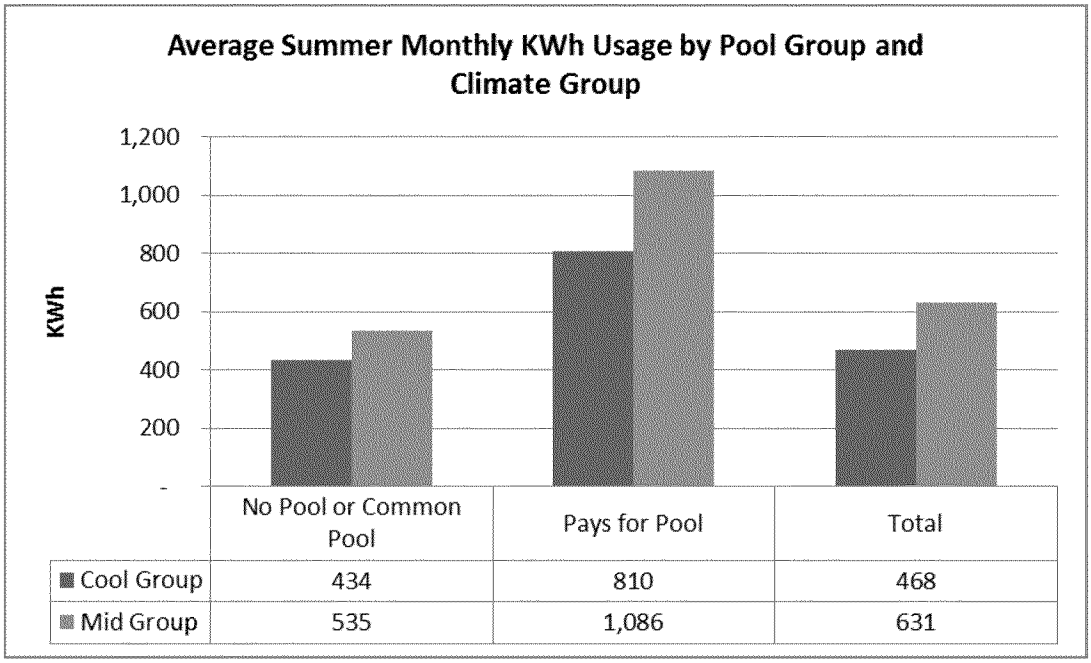
Figure 15: Single-Family Pool Groups by Summer Tier Groups and Climate Group SDGE



	Cool Climate Zone No Pool or Common Pool	Cool Climate Zone Pays for Pool	Mid Climate Zone No Pool or Common Pool	Mid Climate Zone Pays for Pool
Tier 5: 300% BL and above	5.3%	47.1%	3.9%	36.0%
Tier 4: 200-300% BL	17.3%	9.4%	15.0%	37.6%
Tier 3: 130-200% BL	24.8%	16.1%	19.9%	15.4%
Tier 2: 0 to 130% BL	52.6%	27.4%	61.1%	11.1%

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.

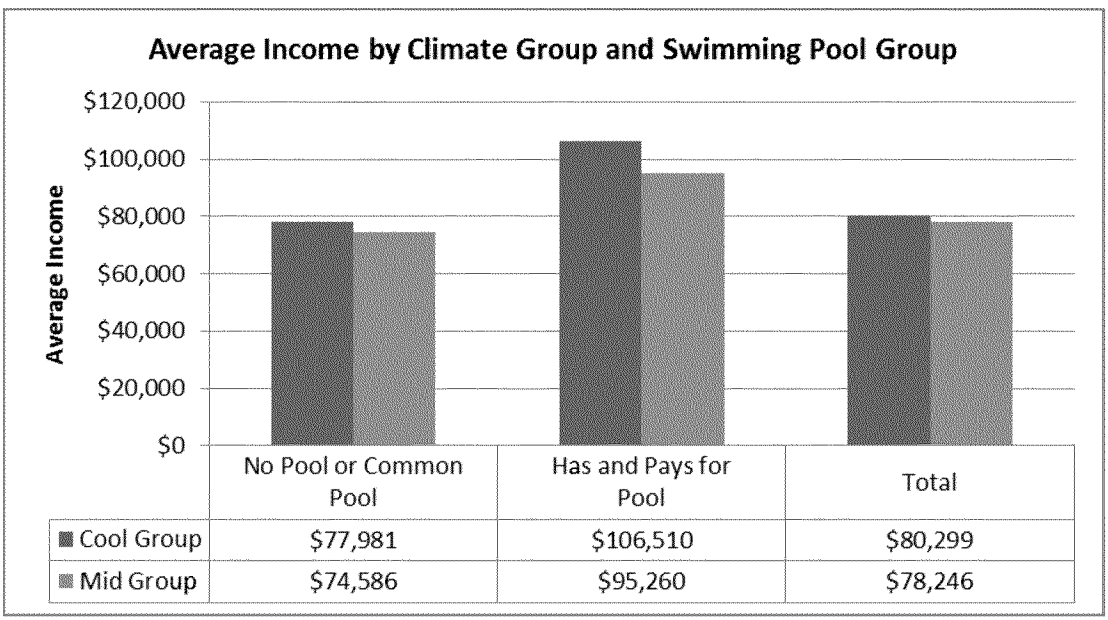
Figure 16: Average Summer Monthly Kwh Usage by Pool Group and Climate Group SDGE



	No Pool or Common Pool	Pays for Pool	Total
Cool Group	434	810	468
Mid Group	535	1,086	631

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



	No Pool or Common Pool	Has and Pays for Pool	Total
Cool Group	$77,981	$106,510	$80,299
Mid Group	$74,586	$95,260	$78,246

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).