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**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)

**RATE DESIGN REFORM PROPOSAL OF  
PACIFIC GAS AND ELECTRIC COMPANY (U 39 E)**

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Pursuant to the Scoping Memo and Ruling of Assigned Commissioner dated November 26, 2012 (Scoping Memo), Pacific Gas and Electric Company (PG&E) provides its Electric Rate Design Reform Proposal (Proposal) in this proceeding, provided as Attachment 1 to this pleading. PG&E's Proposal complies with the Principles of Optimal Residential Rate Design adopted in the Scoping Memo, and responds fully to the questions on rate design proposals also included in the March 19, 2013, ALJ Ruling.

PG&E respectfully requests that the Commission approve PG&E's Proposal, subject to review and approval of a subsequent formal PG&E ratesetting application to implement the Proposal. In addition, PG&E requests that the Commission support the appropriate legislation that is necessary to authorize the Commission to approve PG&E's Proposal and the rate changes to implement it.

Respectfully Submitted,

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# **Attachment 1**

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**ELECTRIC RATE DESIGN REFORM  
PROPOSAL  
OF  
PACIFIC GAS AND ELECTRIC COMPANY  
MAY 29, 2013**

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**Rulemaking 12-06-013  
California Public Utilities Commission**

## TABLE OF CONTENTS

<b>Executive Summary .....</b>	<b>1</b>
<b>1. CHAPTER ONE: PG&amp;E’s Electric Rate Design Reform Proposal .....</b>	<b>10</b>
1.1. Technology Advancements Will Support Customer Engagement in Choosing Among Rate Plans .....	12
1.2. Customer Engagement Is Tailored to the Needs of Different Segments of Customers .....	14
<b>2. CHAPTER TWO: PG&amp;E’s Electric Rate Design Reform Proposal Achieves the Goals of the CPUC’s Rate Design Principles .....</b>	<b>19</b>
2.1. PG&E’s Electric Rate Design Reform Proposal Fixes the Failures of the Existing Residential Electric Rate Design Structure .....	19
2.1.1. Background – Causes of Current Broken Residential Electric Rate Structure .....	20
2.1.2. PG&E’s Rate Design Reform Proposal Moves Residential Electric Rates Closer to Cost-of-Service Over a Transition Period by Streamlining the Rate Tiers and Narrowing the Differential Between the Lower Tier “Baseline Rate” and Upper Tier .....	24
2.1.3. PG&E’s Rate Design Reform Proposal Provides Affordable Rates to CARE and Non-CARE Customers.....	30
2.1.4. PG&E’s Rate Design Reform Proposal Fairly Allocates Fixed Costs of Residential Electricity Service to Customers Through a Monthly Fixed Fee .....	43
2.1.5. PG&E’s Rate Design Reform Proposal Provides Customers with Simpler, More Understandable Rate Options .....	47
2.2. PG&E’s Electric Rate Design Reform Proposal is Based on Marginal Cost and Cost-Causation Principles .....	48
2.3. PG&E’s Electric Rate Design Reform Proposal Encourages Conservation, Energy Efficiency, and Reduction of Both Coincident and Non-Coincident Peak Demand.....	51
2.4. PG&E’s Electric Rate Design Reform Proposal Enhances Customer Choice.....	54

TABLE OF CONTENTS  
(Continued)

2.5.	PG&E’s Electric Rate Design Reform Proposal Provides Explicit and Transparent Incentives and Encourages Economically Efficient Decision-Making. In So Doing, PG&E’s Electric Rate Design Reform Proposal Avoids Unnecessary Cross-Subsidies .....	55
2.6.	PG&E’s Electric Rate Design Reform Proposal Helps Achieve California’s High Priority Energy and Environmental Goals .....	56
2.7.	PG&E’s Electric Rate Design Reform Proposal Makes Appropriate Trade-Offs Among Rate Design Principles .....	57
2.8.	PG&E’s Electric Rate Design Reform Proposal Takes Into Account Uncertainties in Customer Preferences, Wholesale Electric Prices, and Economic Conditions .....	58
2.9.	PG&E’s Electric Rate Design Reform Proposal Enables Time-of-Use Pricing and Other New Customer-Facing Technologies, Tools, Products and Services for Managing Energy Use.....	59
2.10.	PG&E’s Electric Rate Design Reform Proposal Requires Legislative Changes to Fully Implement .....	59
2.11.	PG&E’s Electric Rate Design Reform Proposal Will Adapt Over Time to Changing Load Shapes, Changing Marginal Electricity Costs, and Changing Customer Preferences.....	61
2.12.	PG&E’s Electric Rate Design Reform Proposal Will Promote the Safety of Electric Customers, Employees and the Public .....	61
2.13.	Conclusion – PG&E’s Rate Design Reform Proposal Complies with the Commission’s Optimal Rate Design Principles and Addresses the Commission’s Questions.....	62
<b>3.</b>	<b>CHAPTER THREE: Customer Research Regarding PG&amp;E’s Electric Rate Design Reform Proposal .....</b>	<b>63</b>
3.1.	Summary of Customer Research Key Findings for Rate Design .....	63
3.2.	Customer Research Genesis and Scope .....	64
3.3.	Customer Research Objectives .....	65
3.4.	Results.....	66
3.5.	Conclusion .....	72

TABLE OF CONTENTS  
(Continued)

<b>4.</b>	<b>CHAPTER FOUR: Typical Bill Impacts PG&amp;E Electric Rate Design Reform Proposal vs. Current Rate Structure .....</b>	<b>73</b>
4.1.	PG&E’s Bill Calculator Model.....	73
4.2.	Designing Rates With the Bill Calculator Model.....	74
4.3.	Proposed Rate Design.....	74
4.4.	Cost Basis of PG&E’s End State Rate Design .....	75
4.5.	Energy Conservation .....	76
4.6.	Choice, Simplicity and Stability .....	77
4.7.	Transition Analysis Methodology .....	78
4.8.	Customer Affordability.....	80
4.9.	Conclusion .....	82
<b>5.</b>	<b>CHAPTER FIVE: Benchmarking PG&amp;E’s Electric Rate Design Reform Proposal With Other Utilities in California and Outside California .....</b>	<b>83</b>
5.1.	Scope of Benchmarking.....	83
5.2.	Rate Efficiency .....	83
5.3.	Monthly Fixed Fee .....	84
5.4.	Number of Rate Tiers.....	87
5.5.	Conclusion .....	88
<b>6.</b>	<b>CHAPTER SIX: Policy Recommendations and Next Steps .....</b>	<b>89</b>
6.1.	The Current Residential Electric Rate Structure Fails to Meet the Commission’s Rate Design Principles and Is Unfair and Inequitable to Millions of PG&E’s Customers .....	89
6.2.	PG&E’s Proposal to Reform the Residential Electric Rate Design Structure Will Meet All the Commission’s Rate Design Principles and Remove the Unfairness and Inequity in the Current Rate Structure .....	89

TABLE OF CONTENTS  
(Continued)

6.3.	PG&E Will Provide a Reasonable Transition to Protect Customers and Ensure that Customers Are Fully Aware and Educated on the New Rate Structure.....	90
6.4.	PG&E’s Rate Design Reform Proposal Will Protect Low Income Customers and Increase the Tools and Assistance Available to Those Customers to Help Them Pay Their Utility Bills.....	90
6.5.	PG&E’s Rate Design Reform Proposal Will Provide More Effective Incentives for Energy Conservation and Greater Reductions in Greenhouse Gas Emissions Than the Current Rate Structure .....	91
6.6.	The Commission Should Adopt PG&E’s Electric Rate Design Reform Proposal as the Preferred Rate Design for Residential Electric Rates, and Authorize PG&E to File a Formal Rate Design Application to Implement a New Residential Electric Rate Structure Consistent With the Proposal.....	92
Appendix A Customer Research Survey and Report:		
Appendix A.1 Customer Research Key Findings Report		
Appendix A.2 Customer Research Methodology		
Appendix A.3 Customer Survey		
Appendix B Bill Calculator User Manual		
Appendix C Bill Impact Calculator Results Pursuant to ALJ Ruling, March 19, 2013, Attachment B		

## Executive Summary

The current residential electric rate structure in California is broken. Since the energy crisis more than a decade ago, standard residential electric rates in California have moved far from basic rate design principles, including the key principles that rates should be based on cost to serve and should be understandable to customers. This is simply unsustainable.

PG&E's Electric Rate Design Reform Proposal, presented below, fixes the broken rate design structure and complies with the Principles of Optimal Residential Rate Design adopted in the Scoping Memo in this proceeding. PG&E's Proposal also responds fully to the questions on rate design proposals included in the Scoping Memo as revised by the March 19, 2013, ALJ Ruling. Coupled with enactment of rate reform legislation such as Assembly Bill (AB) 327 (Perea), PG&E's Proposal will provide residential electric customers in California with significant relief from high and volatile electric bills.

### Background

Over a million PG&E residential electric customers are paying electricity bills that are higher than PG&E's average cost of serving them.<sup>1</sup> Unless action is taken soon to fix the way rates are set, many of these customers will pay prices in 2020 that are more than double the average residential cost of service.<sup>2</sup> Figure 1 shows the current problem: an 18.3 cents per kilowatt-hour (kWh) gap between the top tier rate being charged to PG&E's non-CARE customers using more than 130 percent of baseline

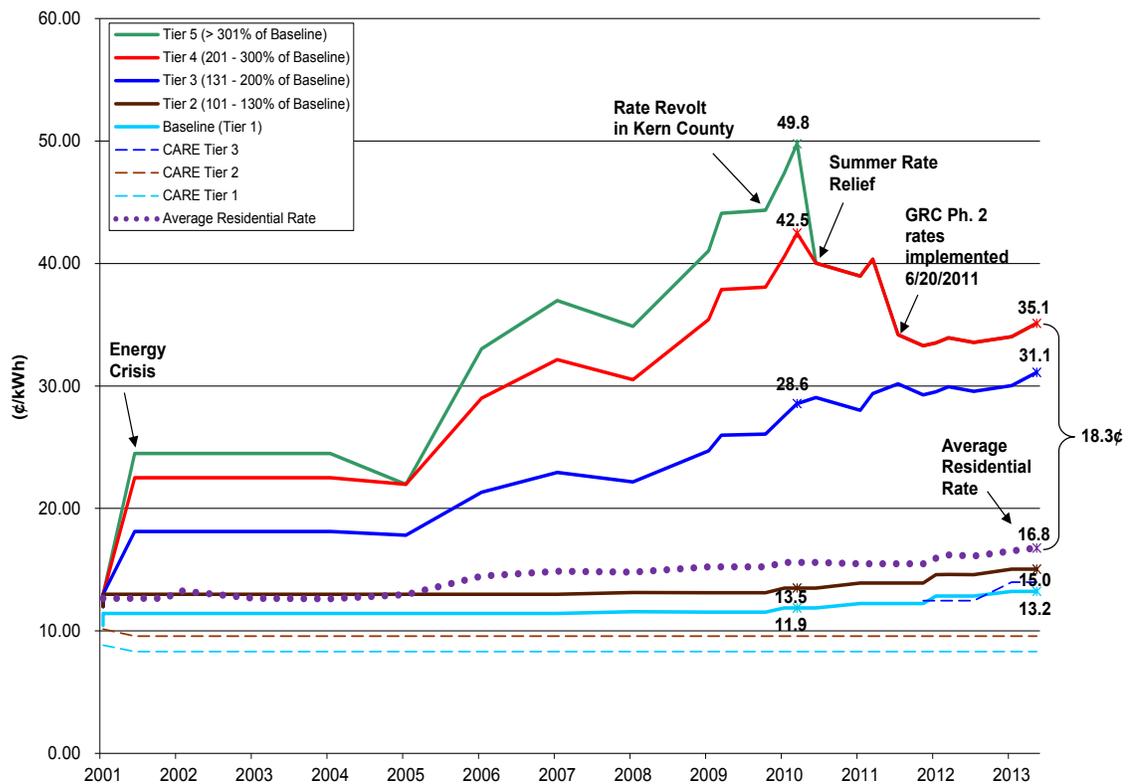
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<sup>1</sup> Based on PG&E's Schedule E-1 residential electric rates effective May 1, 2013, and 2012 residential revenues, accounts and sales by rate schedule.

<sup>2</sup> Based on current PG&E's 2013 revenue requirements in PG&E's 2013 Annual Electric True-up consolidated rate change filing, and PG&E's internal illustrative revenue requirement forecast for 2014-2022, as of May 1, 2013.

quantity (35.1 cents/kWh) and the average rate paid by all of PG&E’s residential customers, represented by the dotted purple line (16.8 cents/kWh). Tier 4 sales are currently being charged more than twice the average residential rate.<sup>3</sup>

**FIGURE 1  
PACIFIC GAS AND ELECTRIC COMPANY  
HISTORICAL PG&E CARE AND NON-CARE RATES  
2001-2013**



The customers harmed by today’s unfair rate structure are not limited to a particular geographic area, such as the Central Valley, but are spread across most of PG&E’s service territory.<sup>4</sup> The majority of these customers are not rich, and they are

<sup>3</sup> While not quite as severe of a premium, Tier 3 sales, too, are charged a rate far in excess of the average rate (a 14.3 cents per kWh differential, or 1.86 times as much).

<sup>4</sup> PG&E Rate Data Analysis, 2012 Annual Statistics for Residential Customers by City, April, 2013.

not eligible for low-income discounts.<sup>5</sup> More than half a million of them are middle class families with household incomes of less than \$75,000 per year.<sup>6</sup> Nor are their overpayments trivial. In fact, one-fifth of PG&E's residential electric customers – over 1 million – now pay an average of \$574 a year in excess of the average residential rate.<sup>7</sup>

Today's skewed, severely inclining tiered electric rates, and their inequitable impact on customers throughout PG&E's service territory, also are very challenging for customers to understand. Market research has shown that a majority of customers do not understand current "tiered" electric rates and many prefer a simpler rate structure.<sup>8</sup> Over half of PG&E customers do not even know they are on a "tiered" rate,<sup>9</sup> and many do not understand how the tiered rate structure – and their energy consumption – drive their utility bills.

High upper-tier rates also create bill volatility. A typical customer with only modest amounts of usage can experience much higher bills during the hottest summer months, merely by driving their modest usage from Tier 2 up into the sharply higher cost usage rates in Tier 3 and possibly Tier 4. This has led to customer frustration,

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<sup>5</sup> Based on sample of PG&E's residential customers responding to 2009 Residential Appliance Saturation Survey (RASS), PG&E matched reported income levels to 2012 usage data from PG&E billing files.

<sup>6</sup> *Id.* Of the 865,000 non-CARE lower income households with annual incomes between \$30,000 and \$60,000, over one-third have high usage and pay an average annual rate that exceeds the residential class average. Similarly, of the 1 million non-CARE moderate income households in the \$60,000 to \$100,000 annual income range, over half have high usage and pay an average annual rate that exceeds the residential class average. In contrast, over 40 percent of the nearly 1.1 million higher income households with incomes exceeding \$100,000 per year have low usage and pay an annual average rate below the residential class average.

<sup>7</sup> PG&E Rate Data Analysis, 2012 Annual Statistics for Residential Customers by City, April, 2013.

<sup>8</sup> "Residential Rate Tiers Survey," King Brown Partners, June, 2012, p. 16.

<sup>9</sup> "RROIR Customer Survey Findings," Hiner and Partners Inc., April 16, 2013.

confusion and dissatisfaction because bill increases are disproportionate compared to the customers' actual changes in usage.

Upper tier rates also distort the impacts of changed revenue requirements on customer bills. Over the next several years, in keeping with California's energy and environmental policy goals and requirements, PG&E needs to make significant investments in infrastructure to improve system reliability and safety, as well as to increase our clean energy resources. PG&E's customers support these utility system investments needed to maintain and improve service, but if the costs are not shared more evenly among all customers who benefit, PG&E and other California investor-owned utilities and policymakers risk a significant consumer backlash.

Fortunately, a balanced solution is within reach. In June, 2012, the California Public Utilities Commission initiated this public rulemaking to consider the problems with the broken rate structure, and the structural reforms needed to fix them.<sup>10</sup> In addition, the California Legislature is currently considering a bill, AB 327 (Perea), that would restore the Commission's traditional authority and obligation to design a fair and equitable rate structure for residential electric customers in open and public proceedings.<sup>11</sup>

The Commission's rulemaking recognizes and reaffirms a cornerstone of public utility regulation in California: that the price of electricity should reflect its cost.<sup>12</sup> The

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<sup>10</sup> *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*, R.12-06-013, June 21, 2012.

<sup>11</sup> AB 327 (Perea), [http://www.leginfo.ca.gov/pub/13-14/bill/asm/ab\\_0301-0350/ab\\_327\\_bill\\_20130423\\_amended\\_asm\\_v98.pdf](http://www.leginfo.ca.gov/pub/13-14/bill/asm/ab_0301-0350/ab_327_bill_20130423_amended_asm_v98.pdf). AB 327 was approved by the California Assembly Utilities and Commerce Committee by a 15-0 vote on April 15, 2013, and by the California Assembly by a 66- 4 vote on May 23, 2013. The Committee analysis of the bill is available at [http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\\_id=201320140AB327&search\\_keywords=](http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB327&search_keywords=).

<sup>12</sup> R.12-06-013, pp. 10-11, June 21, 2012.

Commission has long held that “just and reasonable rates” must be cost-based, ensuring that all customers in all customer classes receive clear and appropriate price signals, fairly based on the cost of serving them.<sup>13</sup> Cost-based rates encourage efficient use of electricity and discourage uneconomic decision-making by consumers. The Commission’s rulemaking also recognizes that the Legislature has authorized limited exceptions to cost-based electricity pricing, in order to ensure that an affordable, basic amount of electricity is provided regardless of climate, heating fuel or medical needs,<sup>14</sup> and that low-income ratepayers are not over-burdened by monthly energy expenditures.<sup>15</sup> Accordingly, after extensive public comment, the Assigned Commissioner and Administrative Law Judges have adopted a list of principles for optimal rate design that are intended to be applied to rate design proposals filed in this proceeding.<sup>16</sup>

## **Summary of PG&E’s Rate Design Reform Proposal**

PG&E supports the rate design principles issued by the Assigned Commissioner and ALJs, and has developed a balanced proposal for structural reform consistent with these principles. PG&E’s Proposal also provides customers with meaningful choices and more control over their electric bills. To that end, PG&E’s Rate Design Reform Proposal:

- Offers **two basic electric rate plan options** that enable customers to choose a plan that works best for them. These include:

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<sup>13</sup> R.12-06-013, pp. 9-11, June 21, 2012.

<sup>14</sup> R.12-06-013, pp. 6-7, 10-11, June 21, 2012.

<sup>15</sup> R.12-06-013, pp. 8-9, June 21, 2012.

<sup>16</sup> *Administrative Law Judge’s Ruling Requesting Residential Rate Design Proposals*, R.12-06-013, p. A1, March 19, 2013.

- A **two-tiered standard residential electric rate**, with baseline allowances that allow for continued relief in the warmer climates across PG&E's service territory where summer usage tends to be higher;<sup>17</sup> and
- A **Time-of-Use (TOU) electric rate** with no tiers to engage those customers who are able to shift their load during the day.<sup>18</sup>

A “standard” electric rate plan is one on which customers who express no preference are placed, while retaining the option to choose another non-“standard” rate plan at a future time.

- Offers all other residential electric rate structures as optional riders to the basic rate plans:
  - **CARE program - a flat percentage discount off the total bill to simplify and improve transparency to customers;**
  - **Critical Peak Pricing (CPP) – higher rates during critical peak periods and credits during other periods**, in order to encourage efficient energy use during the most costly hours of the year; and
  - **Green Option - a premium charge to customers who choose more renewable energy than provided with basic rates.**
- **Captures a reasonable portion of fixed customer service costs through a monthly fixed fee**, while lowering volumetric charges commensurately.

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<sup>17</sup> PG&E is not proposing flat, non-tiered rates at this time, but supports the public policy goal of moving toward flat rates over time, for the same reasons as endorsed by other utilities and policymakers, such as SMUD (“SMUD Set to Lead on Electricity Pricing,” Sacramento Bee, May 16, 2013, <http://www.sacbee.com/2013/05/08/5402834/smud-set-to-lead-on-electricity.html>).

<sup>18</sup> PG&E's new Electric Vehicle rate (Schedule EV) that will go into effect later this year is an example of a TOU rate option with no tiers.

- **Rather than immediately implementing the new standard rate plans, gradually transitions customers** by changing rate values over time to manage bill impacts and allow time for effective customer outreach to educate customers on standard and optional rate plans.

By offering residential electric customers a portfolio of meaningful rate plan options, rather than a “one-size-fits-all” rate design, PG&E stands a much better chance of achieving the majority of its and the Commission’s key principles and policies.

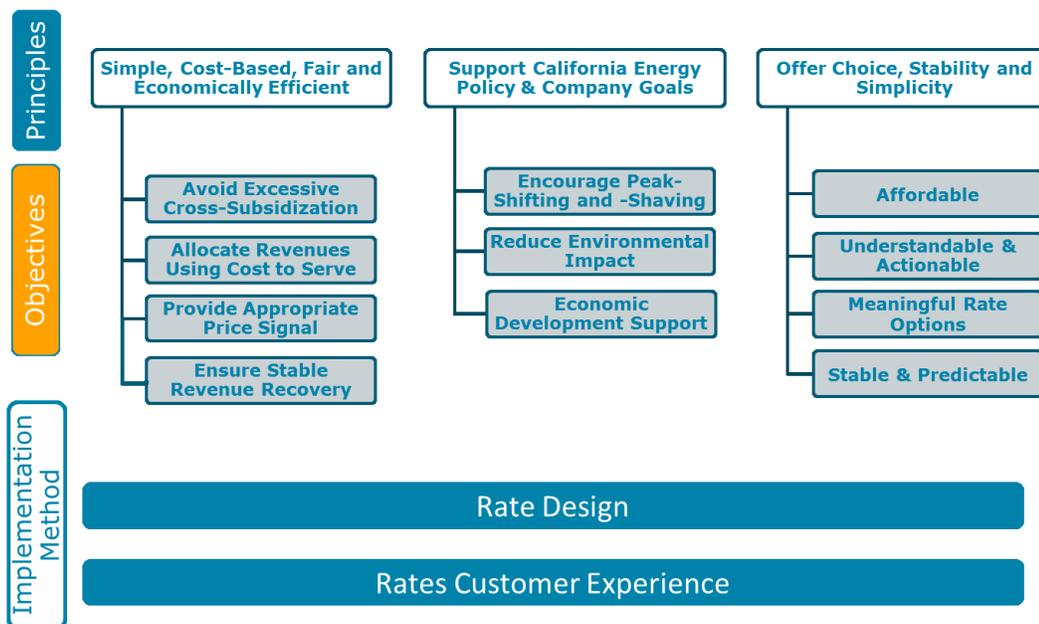
Customer understanding and acceptance of new rates will be a key indicator of the success of residential rate reform. PG&E’s proposed rate design will be phased in over time to allow for enough outreach and education to minimize customer confusion and avoid bill shock. To accomplish this, PG&E proposes several transition principles:

1. **Customers will not be moved to a rate plan** they do not choose. New rates will be offered as options, and as noted above, the rates will be changed slowly over time to manage bill impacts.
2. **Customers will be able to choose and prepare for change** through meaningful outreach and education.
3. **Changes to rate structures, charges and discounts will be introduced gradually** to avoid bill shocks. For example, a monthly fixed fee could start at a low level and slowly be increased over time toward cost. The cost of the CARE discount could be slowly adjusted from the current average of 47 percent discount to an appropriate level, including through better targeting and program efficiency.
4. **The transition will take time** and require different phases of activity. For example, initial changes would be introduced after the CPUC decision in this

proceeding, consistent with legislative authority. Targeted outreach and education to customers with assurance of adequate funding and cost recovery will precede the implementation of new rate options. Over time, the transition to different rate options will correct the unfair rate structure that has been embedded in rates over the past decade.

PG&E’s Rate Design Reform Proposal embodies PG&E’s long-term customer “vision” and priorities, consistent with its overall goal of ensuring that PG&E’s utility services are safe, reliable, and affordable. Figure 2 summarizes PG&E’s residential electric rate design “vision”:

**FIGURE 2  
PACIFIC GAS AND ELECTRIC COMPANY  
PG&E RATE DESIGN VISION**



Upon enactment of legislation that returns authority to the CPUC to review and approve changes in the residential electric rate structure, PG&E intends to implement its Electric Rate Design Reform Proposal by filing a formal ratesetting application at the CPUC requesting specific changes to residential electric rates, including details of a

reasonable transition period to ensure that customers fully understand the new rate options available to them and that the changes to annual electric bills are reasonable, fair and manageable.

Accordingly, PG&E requests that the CPUC in this rulemaking proceeding approve the policies and goals of PG&E's Rate Design Reform Proposal, subject to the opportunity for the CPUC, stakeholders and customers to review the specific details in PG&E's subsequent ratesetting application.

In the chapters below, PG&E shows in more detail how its Rate Design Reform Proposal will fix the broken electric rate structure in California, and provide greater fairness, equity, efficiency, and simplicity for residential electricity customers.

# 1. CHAPTER ONE: PG&E's Electric Rate Design Reform Proposal

The foundation of PG&E's residential Electric Rate Design Reform Proposal is that customers should be engaged to make well-informed choices from a menu of understandable rate options that fairly reflect the cost of serving those customers and provide incentives for demand response, peak shaving, peak shifting, and/or conservation. To engage customers, residential rate design must balance simplicity, efficiency, and stability. PG&E's pro-active customer choice approach will result in more engaged customers who are more satisfied and therefore more likely to provide peak load reduction and other more efficient uses of energy.

PG&E's Rate Design Reform Proposal will offer customers a variety of rate options, including rates with reasonable, equitable tier structures. Rate choices for residential electric customers will include two basic rate options: a standard tiered rate, and an optional, non-tiered time-of-use (TOU) rate plan, with additional rate riders such as an option for critical peak pricing (CPP) as an overlay available on either the standard tiered or optional TOU rate.

PG&E's Rate Design Reform Proposal provides the following changes to residential electric rates over a reasonable transition period:

- Restores gradual tiered rate differentials to bring rates closer to cost-of-service, with two tiers for rates that need a tiered structure while continuing to provide a basic amount of electricity at an affordable price.
- Offers TOU electric rate options with no tiers for those customers who are able to shift their load during the day.

- Includes reasonable monthly fixed fees (also called customer charges) in all residential rates, with a goal of setting these monthly fixed fees over time to recover a reasonable and equitable portion of the fixed costs PG&E incurs to provide and maintain services that do not vary with the customer's actual usage.
- Provides CPP as an option that customers can choose in combination with either TOU or non-TOU rates.
- Makes California Alternate Rates for Energy (CARE) discounts a simple percentage of the non-CARE rates. The objective is to set CARE discounts over time at levels sufficient to ensure affordability for basic needs, while taking into account that historical CARE discounts have been set at 20 percent of non-CARE rates, and make other changes in the CARE program to more effectively target and deliver energy assistance to help low-income customers pay their electricity bills based on updated needs assessments.

By adopting PG&E's Rate Design Reform Proposal, the CPUC will make residential electric rates more equitable, understandable, and stable. However, PG&E's Rate Design Reform Proposal requires that the California Legislature adopt needed changes in law, such as passage of AB 327, to return to the Commission its traditional authority to design reasonable and equitable rates.<sup>19</sup> The rate restrictions maintained in 2009 by Senate Bill (SB) 695 have not permitted the unfair rate structure to be fixed.<sup>20</sup> These restrictions must be eliminated and the authority to adjust all residential

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<sup>19</sup> Assembly Bill 327 (Perea), [http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\\_id=201320140AB327&search\\_keywords=](http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB327&search_keywords=).

<sup>20</sup> Stats. 2009, Ch. 337, Secs. 4 and 5, enacting Public Utilities Code Sections 739.1 and 739.9.

rates, including non-CARE and CARE Tier 1 and 2 rates and the ability to set monthly fixed fees, must now be returned to the Commission.

PG&E's Rate Design Reform Proposal recognizes that a reasonable transition period will be necessary in order to allow customers adequate time to understand, choose and adapt to the new rate design structure. PG&E's approach to implementing its Rate Design Reform Proposal would be to engage customers to make well-informed choices from a menu of understandable rates that provide incentives for demand response, peak shaving, peak shifting, and/or conservation. PG&E's plan will:

- Provide customers with a set of relevant and appealing rate options described above, all of which are simple enough to be effectively explained.
- Educate and provide customers a variety of tools to help them understand their energy use, how it impacts their bills, and then how they can choose the best rates for their circumstances.
- Provide a continuing focus on customer tolerance for change at any given time.

To the extent rates are understandable, fair, and stable, PG&E will be better able to recommend and encourage customers to participate in rates that both achieve the Commission's demand response goals and provide opportunities for customers to better control their energy bills.

### **1.1. Technology Advancements Will Support Customer Engagement in Choosing Among Rate Plans**

PG&E's long-term strategy for residential customers choosing TOU rates includes not only installing SmartMeter™ technology (a process that is now almost complete), but also providing customers with tools to help them understand their rate plan options and make choices that are best for them. PG&E customers whom social

scientists categorize as “Innovators” and “Early Adopters” are already savvy energy users who understand how their behaviors impact their bills.<sup>21</sup> However, the majority of PG&E’s residential customers find current tiered rates confusing,<sup>22</sup> and require help to understand how their bills are calculated, as well as how their behavior impacts their bills.

PG&E already has implemented an online rate analysis tool that customers can access in their online “My Energy” account.<sup>23</sup> The rate analysis tool allows customers with SmartMeters™ to see which rate choice would result in the lowest bill under varying “energy saving behavior” scenarios, if their usage were the same as the previous 12 months. Additionally, the rate analysis tool enables customers to perform simple “what if” scenarios to help them understand how their bill might change under different rates if they can reduce or shift their usage. Another tool allows customers with SmartMeters™ to observe their historical monthly, daily, and hourly energy usage.<sup>24</sup> Part of encouraging customer adoption of TOU rates is education about the availability and benefits of this tool, which has already begun. These tools will help customers obtain near-real-time individualized advice on rate options, as well as education on energy use behaviors that can help them control their energy usage and save money on their bills.

In 2011, PG&E also launched the Green Button in response to the White House’s challenge to design a standard format by which customers could access their

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<sup>21</sup> “Diffusion of Innovations,” Everett M. Rogers, FREE PRESS, 2003, Chapter 7.

<sup>22</sup> “Residential Rate Tiers Survey,” King Brown Partners, June, 2012, p. 16.

<sup>23</sup> PG&E’s “My Usage>My Rates” web page, within the “My Energy” Portal at [www.pge.com](http://www.pge.com) compares bill amounts for available rate plans based on nine to 12 months historical data.

<sup>24</sup> PG&E’s “My Usage” web page, within the “My Energy” Portal at [www.pge.com](http://www.pge.com) provides various electricity and gas usage measurements.

energy-usage data on-line and download the data in a standard format.<sup>25</sup> PG&E was among the first utilities in the country to empower customers with their own data in this previously-unavailable portable format. Making detailed energy usage information available in a standardized file format encourages development of third-party applications that can increase awareness of energy consumption and enables customer engagement in energy conservation, peak-shifting, and peak-reduction behaviors.

## **1.2. Customer Engagement Is Tailored to the Needs of Different Segments of Customers**

The customer outreach and marketing strategy PG&E envisions for its Rate Design Reform Proposal, including non-tiered optional TOU rates, will take into account the hard reality that up to half of all residential customers currently do little or no conservation or peak load shifting and are most likely to resist any attempts at influencing their energy use behavior absent more aggressive outreach and education.<sup>26</sup>

PG&E believes that its Rate Design Reform Proposal, with appropriate and robust customer outreach, can overcome these hurdles within a reasonable time horizon, and that load reduction benefits can be achieved through the gradual, voluntary migration of customers choosing new, more customer-friendly rate options including TOU rates. Under this approach, problems with backlash from highly resistant customers can be avoided.

PG&E's Rate Design Reform Proposal has been developed with consideration for the attitudes and preferences of PG&E's residential customers. Qualitative and

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<sup>25</sup> A "Green Button – Download My Data" link is provided on PG&E's "My Usage" web page within the "My Energy" Portal at [www.pge.com](http://www.pge.com).

<sup>26</sup> "Diffusion of Innovations," Everett M. Rogers, FREE PRESS, 2003, Chapter 7.

quantitative research over the past several years has provided the following key insights for residential rate design:

- **Customers want to choose rather than be defaulted to different rate plan options**
  - The majority of customers want rate plan options that work with their lifestyle, instead of a single “one-size fits all” standard rate plan and limited alternatives
  - Those customers that have opted into alternative rate plans are more satisfied
  - There is no compelling evidence from other electric utility jurisdictions that defaulting customers to a TOU rate plan is a successful approach to engaging customers in the behaviors a TOU rate is designed to encourage
  - There is a significant, identifiable and targetable group of customers that could be transitioned to an opt-in TOU rate over time with an appropriate amount of outreach
- **Customers want a simple way to be able to save money on their electric bills**
  - Customers currently have a very poor understanding about how their energy use behavior impacts their bills
    - Those who opt in to a rate plan believe they have more control over their bills

- Customers prefer more simple rate structures that accurately reflect costs, such as flat, two-tier and two-period TOU rates that don't require much effort to understand
  - Customers do not believe a four-tiered rate is simple or fair
- Customers believe TOU rates would encourage them to conserve energy better than a four-tiered rate.

Evidence from focus groups also has shown that, despite being confused by the current tiered rates, customers are very enthusiastic about the idea of choosing a rate that is adapted to their needs – provided they get help and “actionable” information to choose the plan that best maps to their usage. For example, given time to understand SmartMeter™ functionality, many PG&E customers have stated in focus groups that they can envision using their SmartMeters™ as a tool to help them better understand their usage and allow them to choose a rate plan that helps them reduce their bills.

Although PG&E's optimal rate design cannot be achieved immediately or without trade-offs, the primary goals remain a standard electricity rate structure that is more fair and affordable for all customers by moving rates closer toward the cost of service. In many ways, PG&E's Proposal represents a return to the key principles for cost-based residential electric rates that guided California rate policy before the energy crisis of 2000-2001. These same basic principles have continued to apply to residential gas rates, which have never been subject to the same legislative constraints as the electric rates.

PG&E's Rate Design Reform Proposal substantially mitigates the massive cost-shift problem in the current residential rate structure over a reasonable time frame, and retains the CARE program and the baseline rate structure. This ensures that every

PG&E residential customer has access to an affordable amount of electricity to meet their basic necessities and to help low income customers pay their electric bills.<sup>27</sup>

PG&E's Proposal reforms the CARE and non-CARE rates over a reasonable transition period, in order to better target electric bill subsidies to the neediest customers and return the overall level of the subsidies toward pre-energy crisis levels. The resulting level of assistance will be determined in the appropriate Commission proceedings and take into account updated needs assessments.

PG&E's Rate Design Reform Proposal also is informed by extensive benchmarking PG&E has conducted regarding rate design practices followed in other states and by other public utilities in California.<sup>28</sup> The benchmarking data demonstrate that the vast majority of California publicly-owned electric utilities and many large electric utilities outside California routinely include a monthly fixed fee on residential customers' electric bills as a means of recovering a portion of the fixed costs of their electric facilities. Similarly, many other public utilities, such as water utilities, also routinely include a monthly fixed fee to more fairly recover fixed costs.<sup>29</sup> PG&E's benchmarking also revealed that the overwhelming majority of large electric utilities surveyed outside California – 22 of 25 – have two or fewer tiers for their residential electric rates. PG&E's Rate Design Reform Proposal will not only bring PG&E in synch with other electric utilities in California, it will also align with the consensus rate design principles adopted by major electric utilities outside California.

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<sup>27</sup> Public Utilities Code Sections 382 and 739.

<sup>28</sup> PG&E Survey of California Public Utilities Rates, April, 2013; PG&E Survey of 25 Large Electric Utilities Outside California, 2012.

<sup>29</sup> See, e.g., remarks of CPUC President Peevey, CPUC Business Meeting, May 26, 2011, transcribed by PG&E from a recording.

In Chapter 2, below, PG&E demonstrates that its Rate Design Reform Proposal complies with the CPUC's rate design principles and responds to the questions posed by the CPUC in this proceeding.

## **2. CHAPTER TWO: PG&E's Electric Rate Design Reform Proposal Achieves the Goals of the CPUC's Rate Design Principles**

### **2.1. PG&E's Electric Rate Design Reform Proposal Fixes the Failures of the Existing Residential Electric Rate Design Structure**

PG&E's Rate Design Reform Proposal will fix four gross inequities in the current structure:

- 1) *Over a million moderate and high usage PG&E customers are charged above-cost rates that are unfair and contrary to cost-of-service ratemaking;***
- 2) *Far below-cost CARE rates to 1.2 million PG&E customers provide inaccurate price signals and fail to effectively target appropriate benefits to the most needy customers;***
- 3) *Lack of monthly fixed fees unfairly allocates the fixed costs of PG&E's electric service to higher usage PG&E residential customers while other customers avoid paying for PG&E services that also benefit them;*  
*and***
- 4) *A multitude of different residential tiers and rate schedules confuse customers and discourage them from choosing more efficient rate options such as TOU rates that can help them conserve and save on their electric bills.***

As described below, PG&E's Rate Design Reform Proposal fixes each of these problems over a reasonable transition period.

### **2.1.1. Background – Causes of Current Broken Residential Electric Rate Structure**

To fix the current broken rate structure, it is necessary to understand how it became broken in the first place. For decades preceding the 2000-2001 energy crisis, California had a relatively simple two-tiered inclining block system for electric rates, with the first block moderately discounted and the upper tier slightly higher than the average residential rate as an offset. This structure was first authorized by the Warren-Miller Lifeline Act in 1976.<sup>30</sup> The goals of this Act were two-fold: (1) ensuring affordable rates for essential energy needs, and (2) encouraging electricity conservation.

The original Warren-Miller Lifeline approach was refined through the Baseline Act of 1982, but because it put restrictions on the lower tier price, upper tier prices mushroomed to a Tier 2-to-Tier 1 ratio of 1.74-to-1 by 1987, causing customer backlash. In response, the Legislature passed Senate Bill (SB) 987 in 1989, requiring the CPUC to rapidly phase-in a return to a more “appropriately gradual [tier] differential,” and granting the CPUC the flexibility to do so.<sup>31</sup>

During the 1990s, the CPUC returned rates to a gradual differential between the two rate tiers, resulting in a Tier 1-to-Tier 2 ratio of 1.15-to-1 (a 15 percent differential) in

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<sup>30</sup> Pub. Util. Code Section 739, referenced in R.12-06-13, p. 3.

<sup>31</sup> The Baseline Act, which was passed in 1982 (Ch. 1541, Stats. 1982), was a revision to the Warren-Miller Energy Lifeline Act of 1975 (Ch. 1010, Stats. 1975). The original Act required baseline quantities to be priced at 75 percent – 85 percent of the system average rate (SAR). In 1988, when tier differentials had climbed to a peak of 75 percent, customer complaints about high bills caused the legislature to pass Senate Bill (SB) 987, (Ch. 212, Stats. 1988). That bill included a legislative finding that rates in excess of the baseline quantity were too high and were causing inordinately high residential bills during extreme weather. SB 987 deleted the requirement that baseline rates be established at a discount of between 15 percent – 25 percent less than the SAR, and instead directed the CPUC to increase baseline rates and use the increased revenues exclusively to reduce rates for residential service above baseline. (D.88-10-062; 29 CPUC2d 448 at p. 450.) The 1988 legislative changes also required an “appropriate gradual differential.”

the years prior to the California energy crisis.<sup>32</sup> In addition, SB 987 introduced a program of assistance to low-income ratepayers, with the CPUC implementing a 15 percent discount for eligible customers.<sup>33</sup>

However, during the California energy crisis of 2000-2001, the California Legislature temporarily capped rates in the two lowest tiers in order to protect low-usage customers from soaring prices.<sup>34</sup> It also provided for a significant increase in low-income ratepayer assistance in order to mitigate the impacts of the crisis on customers with fewer financial resources.<sup>35</sup> Unfortunately, the rate caps are still largely in place more than a decade later, long after the energy crisis ended. The discount under the

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<sup>32</sup> To implement SB 987 for PG&E, the CPUC brought PG&E's 1988 electric rate tier differential of 5.1¢/kWh down to 1.9¢/kWh in 1992 and finally all the way to 1.6¢/kWh in 1998. (See e.g., D.89-12-057, 34 CPUC 2d 199, 443 C.O.L. 94, reducing the differential for PG&E's Tier 1 and 2 by 25 percent; D.91-04-063, 39 CPUC 2d 553, 557; D.92-04-063, 44 CPUC 2d 153, 157 – 158; D.93-06-087, 50 CPUC 2d 1, 30 – 34.). (See also D.92-06-020 noting that SCE's residential rate tier differential ratio of 1.39-to-1 had been reduced to a ratio of 1.33-to-1 in 1991 and was on track to reach the CPUC's stated goal of a non-baseline-to-baseline rate ratio of 1.15-to-1 by the 1995 GRC, pursuant to SB 987.) The CPUC phased-in SCE's tier reduction more quickly than for PG&E, over a 3-year period, and reviewed the reductions each year in the ECAC proceeding. (D.92-06-020, 1992 Cal. PUC LEXIS 472, \*87-\*91; 77 CPUC 2d 471; 135 P.U.R. 4th 17.) Similarly, the CPUC established a 3-year phase-in to bring SoCalGas' baseline allowances into compliance with the statutory percentage ranges. (See D.90-01-015, deciding A.89-04-021, SoCalGas' annual cost allocation proceeding; 1992 Cal. PUC LEXIS 33, \*146-\*149; 25 CPUC 2d 3, 109 P.U.R.4th 1.)

<sup>33</sup> SB 987 further required that the CPUC establish a program of low income rate assistance (“LIRA”, the predecessor to today’s CARE program), which then had a flat 15% discount. SB 987’s baseline reductions were “inextricably linked” with this program, to “protect low income ratepayers from the rate increases that accompany baseline reform.” (D.89-09-044, 32 CPUC 2d 406, 409, 412.)

<sup>34</sup> The initial energy crisis legislation was AB 1X, which created a new residential tier for all usage between 100 percent and 130 percent of baseline, allowing no increases on usage below 130 percent of baseline. Later, SB 695, enacting Public Utilities Code Sections 739.1 and 739.9 in 2009, rescinded AB 1X, but replaced it with numerous other restrictions, such as non-CARE Tier 1 and 2 increases limited to CPI plus 1 percent, but no less than 3 percent and no more than 5 percent, and CARE increases limited to 0 percent to 3 percent tied to the CalWORKS index. In addition, the Tier 1 rate for non-CARE customers was restricted to be no more than 90 percent of the system average electric rate.

<sup>35</sup> Senate Bill 5 from the First Extraordinary Session (SB X1, Stats. 2001, Ch. 7), augmented funding for the CARE program by a one-time amount of \$100 million. Decision 01-03-082 and Decision 01-06-010 then increased the eligibility for CARE assistance from 150 percent of federal poverty guidelines to 175 percent of federal poverty guidelines, and the level of the discount from 15 percent to 20 percent. In addition, Decision 01-01-018 exempted CARE customers from the emergency 1 cent surcharge, and Decision 01-05-064 exempted CARE customers from the Tier 3, 4, and 5 surcharges, effectively increasing the CARE discount well above the 20 percent putative level adopted in Decision 01-06-010. Later, CARE eligibility was extended to 200 percent of federal poverty guidelines.

California Alternate Rates for Energy (CARE) program has steadily increased so that it now averages 47 percent for PG&E’s participating customers, compared to the pre-energy crisis level of 15 percent.<sup>36</sup> Because CARE rates have been frozen for much of the last two decades, CARE rates today effectively are 41 percent lower in real terms than they were in the early 1990s.<sup>37</sup>

As a result of these two “temporary” measures capping baseline rates and expanding the CARE program, the costs of the baseline and CARE subsidies have grown by hundreds of millions of dollars, with a significant amount of the costs subsidized by a minority of higher usage non-CARE customers. The CARE participation level and amount of CARE subsidies are shown in Tables 2-1 and 2-2, below.

**TABLE 2-1  
PACIFIC GAS AND ELECTRIC COMPANY  
2012 CARE HOUSEHOLDS AND DISCOUNTS**

Line No.	Highest Tier over 12 Months	CARE Households	Total CARE Discounts	% of CARE Households	% of CARE Discounts
1	Tier 1	240,000	\$29,000,000	19%	4%
2	Tier 2	160,000	30,000,000	12%	4%
3	Tier 3	355,000	108,000,000	28%	15%
4	Tier 4	315,000	203,000,000	25%	27%
5	Tier 5	210,000	370,000,000	16%	50%
6	CARE	1,280,000	\$740,000,000	100%	100%

<sup>36</sup> Compare Decision 00-07-020, approving CARE program funding at a 15 percent discount, with Decision 12-08-044, approving CARE program funding with an effective discount off the total bill of 47 percent, after taking into account CARE customer exemptions from costs borne by non-CARE customers.

<sup>37</sup> CARE rates under 130 percent of baseline were frozen by AB 1X. Subsequently, through GRC Phase II settlements, a CARE Tier 3 rate was not initiated for PG&E until authorized by SB 695, and adopted by the Commission, effective November 1, 2011. For the decrease in CARE rates in real terms, see Application 13-04-012, PG&E’s 2014 GRC Phase II, Exhibit PG&E-1, pp. 3-21 line 11 to 3-22 line 1; see *also* Application 12-02-020 (2012 RDW) PG&E, Quadrini, Exhibit PG&E-4, p. 2-6, lines 8 – 9, and TURN, Record Transcript of William Marcus, p. 304 lines 13 – 28 and PG&E, Quadrini, Exhibit PG&E-5, p. WP 2-10.

**TABLE 2-2  
PACIFIC GAS AND ELECTRIC COMPANY  
CARE PARTICIPANTS AND DISCOUNTS SINCE 2000**

Line No.	Year	CARE Households	Total CARE Discounts
1	2000	200,000	\$30,000,000
2	2001	400,000	\$80,000,000
3	2002	560,000	\$130,000,000
4	2003	650,000	\$150,000,000
5	2004	730,000	\$190,000,000
6	2005	800,000	\$220,000,000
7	2006	940,000	\$380,000,000
8	2007	970,000	\$390,000,000
9	2008	950,000	\$390,000,000
10	2009	1,020,000	\$520,000,000
11	2010	1,230,000	\$720,000,000
12	2011	1,300,000	\$790,000,000
13	2012	1,280,000	\$740,000,000

Table 2-2 illustrates how dramatically the CARE program and CARE discounts have grown over the past 13 years. The landmark development giving rise to this rapid increase in CARE discounts was the energy crisis of 2000-2001. Since the energy crisis, for over 12 years, nearly all of the rising costs have fallen on non-CARE customers in the highest residential electric rate tiers, causing upper tier rates to skyrocket and penalizing those who need to use higher-than-average amounts of energy. As a result, as Table 2-3 below shows, the rates in the highest two tiers are 186 and 210 percent, respectively, of the average price of residential service.

**TABLE 2-3  
PACIFIC GAS AND ELECTRIC COMPANY  
COMPARISON OF CURRENT (E-1) ELECTRIC RATES TO THE RESIDENTIAL AVERAGE RATE**

Line No.	Tier	5/1/2013 Rates	Percent of Average
1	Tier 1	\$0.13230	79%
2	Tier 2	\$0.15040	90%
3	Residential Average	\$0.16772	100%
4	Tier 3	\$0.31114	186%
5	Tier 4	\$0.35114	210%

The important “takeaway” from these causes of the problems with the current residential electric rate structure is that no one single decision or law is responsible for

the “broken” structure. Instead, multiple laws and decisions over more than a decade have cumulatively and often unintentionally shifted hundreds of millions of dollars of the cost of electricity service among different segments of residential electric customers for reasons largely unrelated to cost or equity. At its core, it is the legislative restrictions found in AB 1X and SB 695 that have caused and perpetuated the current broken residential rates, and tied the CPUC’s hands in its ability to fix the inequities.

In this rulemaking proceeding, the CPUC has an opportunity to adopt coordinated public policies to begin to fix the broken structure and return residential electric rates to fair and cost-based levels on a consistent basis among all three investor-owned electric utilities in California. Even so, however, such policies cannot be implemented unless and until legislative reform are adopted that return full residential ratemaking flexibility and jurisdiction to the CPUC.

### **2.1.2. PG&E’s Rate Design Reform Proposal Moves Residential Electric Rates Closer to Cost-of-Service Over a Transition Period by Streamlining the Rate Tiers and Narrowing the Differential Between the Lower Tier “Baseline Rate” and Upper Tier**

PG&E’s current non-CARE Tier 4 rate is 35.1 cents per kilowatt-hour ( $\phi$ /kWh) and its Tier 3 non-CARE rate is now 31.1 $\phi$ /kWh – both far above PG&E’s average non-CARE Schedule E-1 residential rate of 19.4 $\phi$ /kWh. On the other hand, PG&E’s current subsidized lower-tier rates are well below the system average, with non-CARE households in Tier 1 at 13.2 $\phi$ /kWh, and Tier 2 at 15.0 $\phi$ /kWh. The baseline statute in the Public Utilities Code requires that there be an “appropriate gradual differential” in the residential rate tiers. The statute provides:

*In establishing these [tiered] rates, the commission **shall avoid** excessive rate increases for residential customers and **shall establish an***

***appropriate gradual differential between the rates for the respective blocks of usage.*** (PUC §739(d)(1), emphasis added.)

Today, contrary to the baseline statute, there is an 18.3¢/kWh gap between the top tier rate and the average rate paid by PG&E's residential customers. But under the two-tier structure in place during the decade prior to the energy crisis, the CPUC brought what it thought at the time was a too-high ratio of 1.39-to-1 down to its goal of 1.15-to-1.<sup>38</sup> Not only do today's disparate rates already run afoul of the baseline statute's requirement of an "appropriate gradual differential,"<sup>39</sup> but the imbalance is expected to continue and only get worse in future years unless the CPUC acts now.

These rate disparities bear no relation to PG&E's marginal costs or any other measure of cost of service. Rather they are the direct result of post-energy crisis legislative constraints on non-CARE and CARE Tier 1 and 2 rates that continue to force PG&E's upper tier non-CARE residential customers (currently 22 percent of residential sales) to bear most residential cost increases.

For the greater part of almost two decades, from the time it was adopted in 1982 until 2001, the baseline statute formed the basis for a two-tier residential rate structure, with a modest tier differential. During that period, the highest differential between PG&E's two electric rates tiers was just 5.1¢/kWh in 1988, dropping to 1.9¢/kWh in 1992, with further decreases until upper tier rates were set just 1.6¢/kWh above the lower tier baseline rate (for a 15 percent tier differential) from 1998 until the California

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<sup>38</sup> PG&E 1993 GRC Phase II D.93-06-087, 50 CPUC 2d 1, 30-34.

<sup>39</sup> Public Utilities Code Section 739(d)(1).

Energy Crisis in 2001.<sup>40</sup> In the 12 years since then, PG&E has had as many as five tiers, and currently has the following four-tier structure:

Tier 1: usage between zero and 100 percent of Baseline;

Tier 2: usage between 100 and 130 of Baseline;

Tier 3: usage between 130 and 200 percent of Baseline; and

Tier 4: usage above 200 percent of Baseline.

Thus, as a result of legislative restrictions that largely tie the Commission's hands, PG&E's non-CARE residential rates since the energy crisis have gone from a two-tiered structure with just a 1.6 cents per kWh rate differential to a four-tier rate structure with a 21.9 cent difference between PG&E's highest and lowest rates. This steeply inclining structure has no basis in cost, is grossly inequitable to upper-tier users throughout PG&E's service area, and is the direct result of the post-energy crisis legislative constraints on lower-tier rates that continue to force PG&E non-CARE upper-tier sales to bear a disproportionate share of residential cost increases. This inequity is compounded by the fact that Tier 3 usage is considered a normal level of usage for many families, especially during the summer months with air conditioning needs, which means that average, moderate-income families are being charged more than 30 cents per kWh for electricity.

As shown in Figure 1 above, PG&E's non-CARE upper-tier rates today continue to be far above the average residential rate (shown as the dotted purple line in Figure 1). Consequently, upper-tier usage continues to subsidize lower-tier and CARE usage, where the rates are all below the class average rate. Table 2-4, below, shows how rates have changed in percentage terms since the energy crisis. Since 2001,

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<sup>40</sup> See Section 2.1.1, above.

Tier 3 and 4 rates have increased by 240 and 270 percent, respectively, causing a huge gap between the Tier 2 and 3 rates. While the differences between the current Tier 1 and 2 rates, and the even larger differences between the non-CARE Tier 3 and 4 rates, might be fairly characterized as an “appropriate gradual differential,” by no stretch of the imagination can the 16.1 cent per kWh chasm between PG&E’s current Tier 2 and 3 rates be considered anything close to “gradual.”

**TABLE 2-4  
PACIFIC GAS AND ELECTRIC COMPANY  
2001 PRE-ENERGY CRISIS NON-CARE E-1 RATES VS. CURRENT E-1 RATES PER KWH**

Line No.	Tier	January 2001 E-1 Rates(a)	May 2013 E-1 Rates	Percent Change 2001-2013
1	Tier 1	\$0.11430	\$0.13230	16%
2	Tier 2	0.12989	0.15040	16%
3	Tier 3	0.12989	0.31114	240%
4	Tier 4	0.12989	0.35114	270%

(a) Rates effective January 4, 2001.

In a similar fashion, Table 2-5 shows how the rates by tier have changed in real terms since the energy crisis. The second column shows January 2001 rates by tier in nominal terms, and the third column escalates those 2001 rates by inflation to show what they would be in 2013 dollars. In comparison, the fourth column shows the actual rates in 2013. As the fifth column shows, the Tier 1 and 2 rates have declined in real terms since the energy crisis – the result of years of being frozen, followed by just modest increases since the enactment of SB 695. But the Tier 3 and 4 rates have increased in real terms by very large amounts – 80 and 103 percent, respectively. Today, customers whose usage is in the upper tiers are clearly providing a considerable subsidy to those whose usage remains in the lower tiers.

**TABLE 2-5  
PACIFIC GAS AND ELECTRIC COMPANY  
JANUARY 2001 AND 2013 NON-CARE E-1 RATES: NOMINAL VS. REAL**

Line No.	Tier	January 2001 Rates	2001 Rates in 2013 Dollars	May 2013 Rates	Percentage Real Rate Change
1	Tier 1	\$0.11430	\$0.15197	\$0.13230	-13%
2	Tier 2	0.12983	0.17261	0.15040	-13%
3	Tier 3	0.12983	0.17261	0.31114	80%
4	Tier 4	0.12983	0.17261	0.35114	103%

Although the baseline statute does not specify what the minimum percentage differential should be, there is strong evidence from CPUC decisions between 1988 and 2001 that the CPUC viewed an "appropriate gradual differential" as being 15 percent, or a ratio of 1.15-to-1. The CPUC reduced the high tier differentials for the various utilities on an annual, phased basis between 1989 and 1995, to ameliorate bill volatility.<sup>41</sup> In keeping with this 15 percent differential, PG&E's immediate pre-energy crisis baseline (Tier 1) rate was set at the very modest discount of **just 5 percent below the average rate**, and its over-baseline rate (Tier 2, in a two-tier structure) was set at a modest premium of **just 9 percent above the average rate**, with the CPUC concluding that this total differential of about 15 percent sent an adequate conservation price signal.<sup>42</sup>

But, fast forwarding to May 1, 2013, the ratio of today's average Tier 3 over Tier 2 rate, is 2.07-to-1 – well over 1990 electric rate tier ratios that the CPUC found needed to be reduced (e.g., the CPUC declared in 1992 that SCE's tier ratio of 1.39-to-1 needed to be gradually reduced each year until it reached a 1.15-to-1 ratio by 1995.)<sup>43</sup>

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<sup>41</sup> See D.89-09-044, and D.90-06-020, 1992 Cal PUC LEXIS 472, \*87-\*91; 44 CPUC 2d 471; 135 P.U.R. 4th 17.

<sup>42</sup> See A.12-02-020 (PG&E's 2012 RDW), Quadrini, Exhibit (PG&E-2, p. 2-9, lines 9 – 11).

<sup>43</sup> D.92-06-020, 44 CPUC 2d 471, 506.

Today, PG&E’s current upper tier rates are higher in absolute terms than those in place for both SCE and SDG&E:

**TABLE 2-6  
PACIFIC GAS AND ELECTRIC COMPANY  
COMPARISON OF STANDARD 2013 NON-CARE RATES BY TIER AND UTILITY(a)**

Line No.	Tier	PG&E (\$/kWh)	SC&E (\$/kWh)	SDG&E (\$/kWh)(b)
1	Tier 1	\$0.132	\$0.128	\$0.148
2	Tier 2	0.150	0.160	0.171
3	Tier 3	0.311	0.271	0.265
4	Tier 4	0.351	0.311	0.285
5	Monthly fixed fee (\$/month)	N/A	\$0.91	N/A

- (a) SCE’s rates are based on 53 percent baseline quantities for basic customers, and 60 percent in the summer and 70 percent in the winter for all-electric customers. PG&E’s and SDG&E’s rates are based on 55 percent baseline quantities, except for 65 percent baseline quantities in the winter for all-electric customers.
- (b) SDG&E’s rates are a simple average of summer and winter rates.

To fix this serious problem, PG&E’s Rate Design Reform Proposal reduces the number of residential rate tiers to two on its standard E-1 rate plan – the baseline rate and a single additional tier.<sup>44</sup> In addition, PG&E’s Rate Design Reform Proposal returns PG&E’s current upper tiered rates over a reasonable transition period closer to the historical 1.15-to-1 average differential previously approved by the CPUC. The fundamental driver of PG&E’s Rate Design Reform Proposal is one of fairness: to make progress in reversing the inequity in the current above-cost, steeply inclining block rate design and the associated rate disparities between the lower and upper tier non-CARE rates. PG&E’s Rate Design Reform Proposal will achieve this goal by moving rates closer to cost of service.

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<sup>44</sup> Under PG&E’s proposal, the Tier 1 rate would apply to usage between zero and the customer’s baseline amount, and the Tier 2 rate would apply to all usage above the baseline amount. This represents a return to the tier definitions that were in effect prior to the Energy Crisis.

### **2.1.3. PG&E's Rate Design Reform Proposal Provides Affordable Rates to CARE and Non-CARE Customers**

PG&E's rate design reform proposal keeps the CARE rate discount by reforming the overall CARE program over time to set the level of the CARE rate discount more in line with levels that would be affordable to support basic electricity needs and taking into account the 20 percent level set just after the 2000-2001 energy crisis, versus today's actual 47 percent level.<sup>45</sup> At the same time, PG&E's Proposal aligns and targets the CARE discount to updated needs assessments of different segments of CARE eligible customers, including considering adjusting the level of the discount to different usage levels and other objective criteria.

SB 695 established that CARE rates can have no more than three tiers and that CARE rates may not exceed 80 percent of the corresponding non-CARE rates, excluding other costs from which CARE customers are exempt, such as the cost of the Department of Water Resources (DWR) Bond charge, the CARE surcharge and the cost of the California Solar Initiative.<sup>46</sup> SB 695 also purported to permit limited increases to CARE Tier 1 and Tier 2 rates under certain circumstances for the first time in nearly twenty years; however, since passage of SB 695, there have been no increases to Tier 1 and 2 CARE rates in 2010, 2011, 2012 or 2013 due to the lack of change in the index adopted in SB 695 governing increases to CARE rates.<sup>47</sup>

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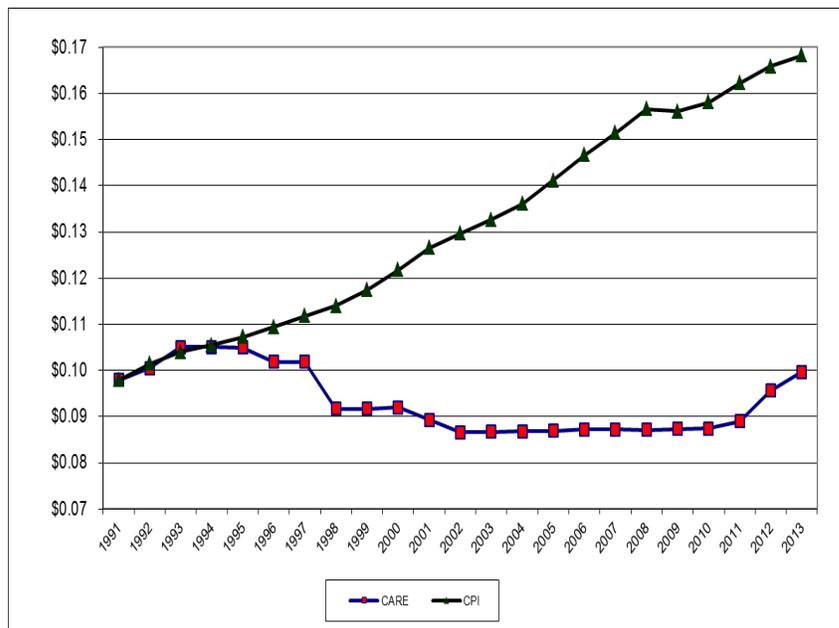
<sup>45</sup> Prior to the energy crisis and for 11 years before, the low income rate discount had been 15 percent. By late 2001, following CPUC adoption of a 20 percent discount during the energy crisis, the provisions of Pub. Utils. Code Section 739.1(b)(5) established a target for the CARE discount of 20 percent.

<sup>46</sup> Pub. Utils. Code Section 739.1(b)(4), Stats 2009, Chapter 337, Section 4, Effective October 11, 2009.

<sup>47</sup> Pub. Utils. Code Section 739.1(b)(2) indexed the CARE Tier 1 and 2 increases to the annual percentage increase in benefits under the CalWORKS program as authorized by the Legislature each year. However, since SB 695 was passed in 2009, the CalWORKS index has been suspended. Thus, there has been no increase in CARE Tier 1 and 2 rates under Pub. Utils. Code Section 739.1(b)(2). See Application 12-02-020 (PG&E's 2012 RDW), TURN, Marcus, Record Transcript (RT). p. 309, lines 6 – 11) and DRA, Khourry, RT. p. 376, lines 5 – 26.

The inability to increase CARE Tier 1 and 2 rates has driven a widening gap between CARE and non-CARE rates – thus increasing the CARE discount well beyond the 20 percent level intended to the current level of 47 percent for PG&E customers. Even though a CARE Tier 3 rate was added in November, 2011, and was increased 1.5 cents/kWh in January, 2013, the disparity between lower tier rates already had increased substantially when compared to the CARE discount that was in place in 2001. As a result, as Figure 2-1 indicates below, the average CARE rate (including Tier 3) is now 41 percent lower than it was in 1991 after adjusting for inflation. This widening gap between CARE and non-CARE rates has put further unsustainable pressure on upper tier non-CARE rates to support the increasing discount.

**FIGURE 2-1  
PACIFIC GAS AND ELECTRIC COMPANY  
AVERAGE CARE (EL-1) RATE VS. CPI  
1991-2013**



Statewide, nearly 5 million customers of PG&E, SCE, SDG&E, and SoCal Gas are receiving CARE assistance,<sup>48</sup> and the combined overall costs of the CARE program have ballooned to nearly ten times pre-energy crisis levels, from \$140 million in 2000 to approximately \$1.3 billion annually for the 2012-2013 program period.<sup>49</sup> The growth in the CARE program combined with the current tiered structure of residential electric rates has caused the actual level of the CARE rate discount to significantly exceed the intended 20 percent discount. For PG&E, the current average CARE rate discount is 47 percent.

Moreover, for most of the post-energy crisis period PG&E – unlike the other two California investor-owned utilities – did not have a CARE Tier 3 rate. PG&E was only able to implement a CARE Tier 3 rate for the first time in November 2011, and the level of PG&E’s current CARE Tier 3 rate is significantly below the similar rates of SCE and SDG&E.<sup>50</sup> Table 2-7 compares PG&E’s CARE rates to those of the other two IOUs. All of PG&E’s CARE rates remain substantially below those of the other two IOUs.

**TABLE 2-7  
PACIFIC GAS AND ELECTRIC COMPANY  
COMPARISON OF STANDARD CARE RATES BY TIER AND UTILITY(a)**

Line No.	Tier	PG&E 2013 (\$/kWh)	SCE 2013 (\$/kWh)	SDG&E 2013 (\$/kWh)
1	Tier 1	\$0.083	\$0.085	\$0.099
2	Tier 2	0.096	0.107	0.116
3	Tier 3	0.140	0.207	0.170
4	Monthly fixed fee (\$/month)	N/A	0.70	N/A

<sup>48</sup> D.12-08-044, p. 22 (as of December, 2011).

<sup>49</sup> Compare, D.12-08-044, Ordering Paragraph 1, p. 369, to D.00-02-026, Attachment 4, July 6, 2000.

<sup>50</sup> PG&E recently has presented a proposal in its 2014 GRC Phase 2 case to fix this CARE Tier 3 rate disparity. No legislative changes are needed to make this change, and it can and should be addressed in that proceeding.

PG&E's Rate Design Reform Proposal is consistent with various reforms to CARE customer eligibility, enrollments, and income verification processes begun by the CPUC in 2012.<sup>51</sup> Assigned Commissioner Ferron recognized the need for evaluation of the CARE program in his concurring opinion to the CPUC's 2012 CARE decision:

*Based on my further review of the CARE subsidy, I seriously question whether we are targeting the right overall objective. ... We need to balance the societal benefits of maximizing the number of eligible participants against the excessive costs of having too many ineligible participants. I think that we need to more closely examine this going forward. **The truth is, we just do not know if the benefits of pushing for wider enrollment justify the growing costs associated with this subsidy. And we should know this.***

*I am particularly concerned that we monitor and effectively use the data that we are ordering the IOUs to track in this Decision. The Decision provides three opportunities for us to ensure that we are being good stewards of the public dollar: 1) the Initial Enrollment Stage, which requires limited documentation of the customer's eligibility, or in the case of so-called self-certified participants, no documentation at all; 2) the Re-Certification Stage, which requires the customer to document - or in the case of self-certified customers, to attest to - their continued eligibility; and 3) the Post-Enrollment Verification process, by which the IOUs monitor changes in eligibility between verification cycles and obtain data for use in improving the accuracy of customer enrollments.*

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*It is my hope that we will have a better understanding of the statistical profile of both eligible and non-eligible customers relative to the entire population, which will inform future decisions in time for the next application cycle. I am particularly concerned that we understand the impact of allowing customers to enroll and to continue to participate by means of self-certification alone. I am hopeful that through a robust and scientific verification process, we will have high confidence that our programs are readily accessible to those who are truly eligible for assistance, and yet have adequate safeguards against ineligible participation.<sup>52</sup>*

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<sup>51</sup> Decision on Large Investor-Owned Utilities' 2012- 2014 Energy Savings Assistance (ESA)(Formerly Referred to as Low Income Energy Efficiency or LIEE) and California Alternate Rates for Energy (CARE) Applications, Decision 12-08-044, August 23, 2012.

<sup>52</sup> D.12-08-044, Concurrence of Commissioner Mark J. Ferron, pp. 1-2.

In addition, the CPUC noted reports from PG&E that when it performs post-enrollment verification of CARE customer eligibility, including income verification, approximately 61 percent of its CARE customers are de-enrolled for a variety of reasons, including income ineligibility.<sup>53</sup> As a result, the CPUC's 2012 decision approving CARE and ESAP budgets for the 2012-2014 program period adopted changes that restrict high usage customers' ability to remain on CARE assistance without undertaking energy efficiency measures.<sup>54</sup> In addition, the CPUC began some limited studies of methodologies to tighten the post-enrollment income verification processes used by the utilities.<sup>55</sup>

PG&E's proposed changes to the CARE discount would be coordinated with the CPUC's overall CARE reforms, in order to ensure that CARE rate discounts are targeted more effectively to help low income customers pay their bills and manage their energy use. The CPUC is updating data from 2007 on energy burden (the percentage of household income needed to cover electric and natural gas bills) by income strata and geographic area in California.<sup>56</sup> The last such study (by KEMA) found that PG&E's low income customers on average pay 4% of their income for their total energy bill (electric plus gas).<sup>57</sup> This breaks down as 2.5 percent for electric and 1.4 percent for natural gas. However, as discussed above, CARE customers have long benefitted from CARE rates frozen at extremely low levels, so that the inflation-adjusted level of CARE assistance to low income customers is actually 32 percent higher than the level adopted

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<sup>53</sup> D.12-08-044, p. 203.

<sup>54</sup> D.12-08-044, Ordering Paragraph 101, pp. 400-402.

<sup>55</sup> D.12-08-044, Ordering Paragraphs 89-97, pp. 395-399.

<sup>56</sup> D.12-08-044, Ordering Paragraphs 107-109, pp. 404-406.

<sup>57</sup> See "Final Report on Phase 2 Low Income Needs Assessment" prepared for the CPUC by KEMA, Inc., September 7, 2007, page 5-9 and page 5-11 showing that for customers who take both gas and electric service from PG&E, on average, their natural gas-only energy burden was 1.4 percent.

following the KEMA study in 2007, having increased from about \$400 per customer in 2007 to about \$580 in 2012.<sup>58</sup>

Accordingly, PG&E proposes to make downward adjustments to the level of the CARE discount over a reasonable period of time. PG&E also is open to considering adjusting the actual discount to different segments of eligible customers based on various levels of usage and other objective criteria as well as incorporating the results of updated needs assessments. Coupled with anticipated reforms of the CARE program itself, the level of CARE assistance to PG&E low income customers should be sufficient to ensure that PG&E electric bills are reasonably affordable to needy customers. PG&E's Rate Design Reform Proposal is intended to ensure CARE bill impacts that are modest in dollar terms, and reasonable given the need to address high upper tier bills.

When Lifeline and Baseline rates were first implemented, there was no separate CARE program. That is, the generally available lower Tier 1 or baseline rate was intended to ensure that electric service was affordable for low-income customers. Today, with the longstanding implementation of a special program for CARE customers, combined with the relatively low level on non-CARE Tier 1 and Tier 2 rates, this brings into question the need to even have an inverted tier structure for non-low-income customers for affordability purposes. A substantial proportion – approximately 57 percent – of PG&E's non-CARE upper tier customers, who have for so long been affected by higher tier rates, are indeed moderate or even lower income customers.<sup>59</sup> Affordability is a significant issue for these customers as well.

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<sup>58</sup> The average assistance per customer is calculated from Table 2-2.

<sup>59</sup> Based on 2009 RASS sample data. High tier customers are those that have tier-3 or above usage. An annual income in the range of \$60K to \$100K is defined as moderate income, and income below \$60K is defined as low income.

PG&E's demographic analyses indicate that there is not a strong correlation between income and usage, and that thousands of PG&E's higher-use customers are moderate or lower income.<sup>60</sup> This is intuitively true based on the living characteristics of PG&E's large service territory in northern and central California, with a variety of electricity consumption levels based on differences in family size, including families with children and elderly members and differences in housing vintage.

On the one hand, there are thousands of low and moderate income families living in the Central Valley and outer suburbs of the San Francisco Bay area whose need for air conditioning in the summer months pushes their electricity demand into the above-cost, higher tiers. On the other hand, there are higher income single people who are earning over \$100,000 a year in places like San Francisco and the coastal areas where cooler weather allows them to keep their electricity usage in the lower tiers, substantially below the cost of service.

As TURN has pointed out, under these demographic characteristics, "you end up getting into issues of correlation of high usage with housing stock of larger square feet and larger family size."<sup>61</sup> There is "somewhat more dispersion" of incomes among those with upper tier usage, with TURN's data showing a group of 18 percent to 32 percent of customers with usage in Tier 4 having moderate incomes, depending on climate zone.<sup>62</sup>

Demographic data on PG&E's customers demonstrate that steeply inclining upper tier rates hurt many moderate income families. Contrary to some previous

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<sup>60</sup> See Figure 2-5, below.

<sup>61</sup> TURN, Marcus, TR. p. 326, line 25, p. 327, line 19 and p. 329, lines 13-14, in PG&E's 2012 Rate Design Window Application 12-02-020 (February 29, 2012).

<sup>62</sup> *Id.*

assumptions, customers with upper tier usage in fact are *not* synonymous with being rich. While there is a positive correlation between income and usage, that correlation is weak. Consequently, steeply tiered rates harm many lower and moderate income families and, conversely, reward many high income families. Of the 865,000 non-CARE lower income households with annual incomes between \$30,000 and \$60,000, over one-third have high usage and pay an average annual rate that exceeds the residential class average.<sup>63</sup> Similarly, of the 1 million non-CARE moderate income households in the \$60,000 to \$100,000 annual income range, over half have high usage and pay an average annual rate that exceeds the residential class average.<sup>64</sup> In contrast, over 40 percent of the nearly 1.1 million higher income households with incomes exceeding \$100,000 per year have low usage and pay an annual average rate below the residential class average.<sup>65</sup>

PG&E understands that the theory behind tiered rates has included the concept that lower rates for lower usage customers will provide necessary financial assistance to low-income customers while encouraging high income, high users to conserve. However well-intentioned this theory, it is not supported by the facts, and the current tiered rate structure actually penalizes many of the same moderate and low income customers that policymakers intend to help. Furthermore, direct, transparent discounts provided by CARE rates to income-eligible customers are a more effective means of targeting rate discounts for low income customers than reduced rates for a defined level of usage available without regard to need.

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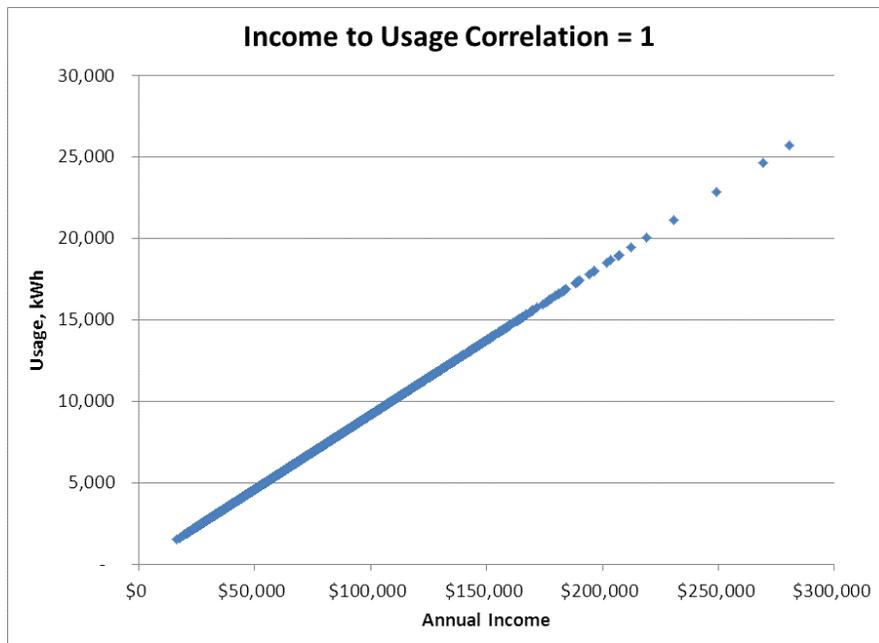
<sup>63</sup> Based on RASS 2009 sample and 2009 usage for PG&E customers only. High usage is counted as 1/12 for each month with tier 3 or above usage for each customer.

<sup>64</sup> *Id.*

<sup>65</sup> *Id.*

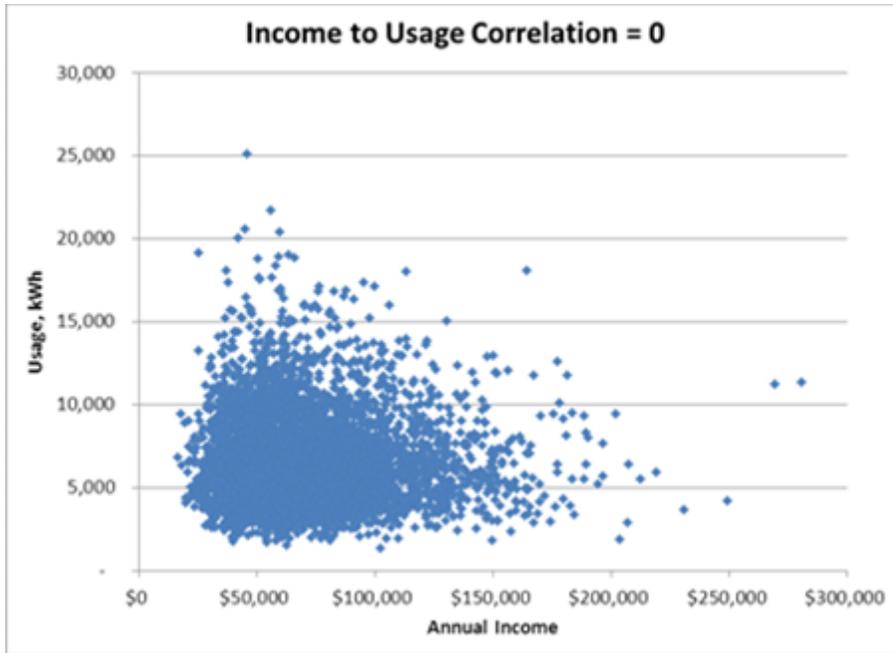
Figure 2-2, below, illustrates what a perfect positive correlation between income and residential electric usage would look like in PG&E's service territory. At the other end of the spectrum, Figure 2-3 shows an example of zero correlation between income and usage. Figure 2-4 shows the actual correlation between income and usage from PG&E's 2009 Residential Appliance Survey Saturation (RASS) data.<sup>66</sup> The estimated correlation is relatively weak, at just 0.33. As the scatter plots show, Figure 2-4 looks similar to Figure 2-3.

**FIGURE 2-2  
PACIFIC GAS AND ELECTRIC COMPANY  
ILLUSTRATION OF PERFECT POSITIVE CORRELATION BETWEEN INCOME AND USAGE**

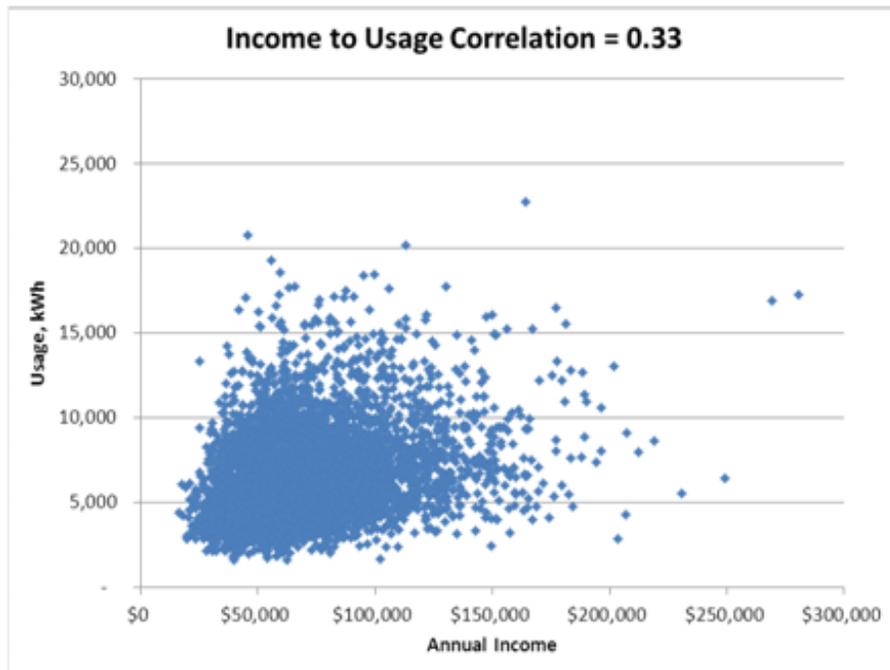


<sup>66</sup> See A.13-04-012 (PG&E's 2014 GRC Phase II), Quadrini, Exhibit PG&E-1, p. 3-113 line 26 to p. 3-15.

**FIGURE 2-3**  
**PACIFIC GAS AND ELECTRIC COMPANY**  
**ILLUSTRATION OF ZERO CORRELATION BETWEEN INCOME AND USAGE**



**FIGURE 2-4  
PACIFIC GAS AND ELECTRIC COMPANY  
ACTUAL INCOME TO USAGE CORRELATION  
2009 RASS DATA<sup>67</sup>**



Taking into account these demographic differences, PG&E Rate Design Reform Proposal is structured so that any bill increases for non-CARE customers are modest in dollar terms in order to achieve meaningful decreases in upper tier rates. On a percentage of bill basis, the bill increases also are more modest when compared to the nominal percentage rate changes. Such modest bill increases are a reasonable tradeoff for making additional, though slight, progress on reining in exorbitantly high upper tier rates. These modest bill increases for the lower tier non-CARE users who largely have been protected from any significant rate increases for the last twenty years, are necessary to lift the burden on upper tier users, thousands of whom are located in inland parts of PG&E's service area where air conditioning is essential for low or moderate income working families. Moreover, because sales are distributed more

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<sup>67</sup> The 0.33 correlation was estimated from the RASS 2009 sample. The scatter plot shown is based on that estimated correlation for illustrative purpose; the actual data is not shown in this plot.

heavily in the lower two tiers than the upper tiers, *it is possible to decrease the upper tier rates* (and, consequently, the bills of upper tier users) *significantly with only modest bill increases for those consuming in the lower tiers at this time.*

PG&E is cognizant that disabled and low-income customers in its service area are struggling economically. But the problem of income insufficiency cannot be addressed in any meaningful way by freezing electric rates for nearly two decades at below-cost levels. Needy families do merit greater assistance, but electric rates are not a good tool for doing so. More direct, targeted assistance is a more appropriate and efficient way to deal with the societal and humanitarian issue of poverty. PG&E's Rate Design Reform Proposal is intended to phase-in changes in CARE rates that do not significantly increase the energy burden of needy customers, while improving the efficiency of the program itself.

Against this backdrop on energy burden, PG&E's Rate Design Reform Proposal is structured to allow the CPUC to continue to make progress toward relieving current rate inequities that built up over many years, especially since doing so is likely to result in a reasonably affordable average bill increase for a typical usage CARE customer. Still another way to assess affordability is on a statewide basis, and indisputably both SCE and SDG&E have higher CARE rates paid by these same income groups. For example, Table 2-7 shows that PG&E's CARE Tier 3 rate of 14.0¢/kWh is significantly lower than SDG&E's current rate of 17.0¢/kWh, and even farther below SCE's rate of 20.7¢/kWh. Even though the Southern California utilities' CARE Tier 3 rates are well above PG&E's, there is no evidence that their rates have created any huge affordability problem.

PG&E's Rate Design Reform Proposal maintains both the CARE rate discount and baseline rates, while moving both rates over time back to the levels intended by the Legislature and CPUC prior to the 2000-2001 energy crisis. In so doing, PG&E will take into account both the CPUC's ongoing reforms to the CARE program and its historical determination of basic electricity needs under the baseline statute. For example, while SMUD recently proposed a 38 percent discount for its version of CARE customers in 2014, the maximum dollar discount allowed is capped at \$52 per month. The utilization of such a maximum dollar per month cap (albeit not necessarily set at \$52 per month) may represent a reasoned trade-off between providing relief to those requiring financial assistance, and avoiding an excessive impact on non-CARE customers who must fund those discounts.

This coordinated consideration of both the CARE and baseline rate assistance programs is essential, because the definition of "affordability" of electricity in California applies to both. As the baseline statute and the history of its implementation demonstrates, "affordability" is defined as assuring a discounted electricity rate for a *limited* quantity of electricity to serve basic needs (not *all* electricity usage), while at the same time assuring that the difference between the discounted rate and higher usage electric rates is maintained at a *gradual* differentiation.<sup>68</sup> Likewise, the CARE statute makes clear that CARE assistance can be provided as a rate discount or through other forms of assistance such as energy efficiency measures, and that the level of CARE assistance should assist eligible low income customers to pay their energy bills, but that the particular level of assistance is left to the determination of the CPUC as long as it

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<sup>68</sup> Public Utilities Code Section 739(b),(d).

provides an equivalent discount of at least 20 percent compared to non-CARE electricity bills.<sup>69</sup>

PG&E's Rate Design Reform Proposal is structured to make steady progress toward addressing the gross inequities in the residential rate structure, while still providing very substantial assistance to mitigate the energy burden of disabled and low-income customers on the CARE rate schedule.

#### **2.1.4. PG&E's Rate Design Reform Proposal Fairly Allocates Fixed Costs of Residential Electricity Service to Customers Through a Monthly Fixed Fee**

A monthly fixed fee to recover fixed costs of utility service is a key tool for fulfilling the very important ratemaking principle of cost causation. In the context of residential rate design, there are a number of categories of costs that do not vary with the volumes of kWh consumed by customers. First, there are customer access and revenue cycle service costs that, for non-residential customers, are generally collected via monthly customer charges. These include the costs of connecting a customer to the grid and maintaining that connection and service to the account—including metering, preparing and sending bills, processing payments, providing service center resources, and other grid-related costs. Second, there are capacity-related costs associated with generation, transmission, and distribution assets. These generation and grid costs are driven by customers' coincident and non-coincident demands on the PG&E system and for non-residential customers are generally collected via demand charges. Finally, PG&E's revenue requirements include the costs of various programs such as those that support

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<sup>69</sup> Public Utilities Code Sections 382(b) ("Energy expenditure may be reduced through the establishment of different rates for low-income ratepayers, different levels of rate assistance, and energy efficiency programs"), 382(c) ("Nothing in this section shall be construed to prohibit electric and gas providers from offering any special rate or program for low-income ratepayers that is not specifically required in this section"), 739.1(b)(1).

incentives for energy efficiency or rate reductions for low-income customers under CARE. These program costs do not change according to changes in consumption by non-CARE customers. For a customer class like residential, though, where demand charges are not currently employed, it may be more appropriate to collect these types of costs through a fixed monthly charge rather than through volumetric charges, since the costs are incurred by the utility on behalf of each individual customer and do not change based on the volume of electricity that the customer consumes.

In situations where certain costs are fixed and cannot be avoided, setting a rate to recover these costs through monthly fixed fees, rather than through volumetric rates, appropriately reflects cost causation, and supports more equitable recovery of PG&E's fixed costs among customers. These fixed costs should be paid by all customers, rather than shifted unfairly from some onto others.

Consistent with this fair and efficient cost-causation principle, the CPUC has approved fixed fees for every one of PG&E's *nonresidential* rate schedules—in recognition that this is an appropriate way to collect fixed costs.<sup>70</sup> Because PG&E incurs these same fixed costs to serve residential customers, a monthly fixed fee that similarly does not vary with consumption would be appropriate for these customers as well.

In addition, a monthly fixed fee allows for a reduction in higher tiered volumetric rates, providing further movement of overall residential electric rates towards cost. It will help minimize the inequity in the current inclining block rate design and the associated rate disparities between the lower and higher tier non-CARE rates and between CARE and non-CARE rates. Adoption of a monthly fixed fee will contribute to

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<sup>70</sup> See A.10-03-014, PG&E's 2011 GRC Phase 2, Keane, Exhibit PG&E-2, p. 1-11 to 1-12.

reversing these disparities. A modest monthly fixed fee would allow a significant reduction in PG&E's Tier 3 and 4 rates. In that respect, it is a key component of PG&E's total Residential Rate Design Proposal.

A monthly fixed fee also is more cost-based than alternatives such as the existing minimum bill amount. Fixed costs are incurred to serve all customers. Consistent with this cost-causation, the monthly fixed fee applies to all customers. In contrast, a minimum bill amount is applied only to a very small percentage of customers with little or no usage in a given month. For example, for the current minimum bill on PG&E residential rate Schedule E-1 to apply, a customer would have to use just 34 kWh or less in a month (since 34 kWh times 13.2 cents equals \$4.50). Only about 3 percent of PG&E's total E-1 customers have usage this low in any given month.

The monthly fixed fee also is more equitable because it charges all customers on a rate schedule the same amount to cover a portion of PG&E's fixed costs. For example, a \$3.00 customer charge on PG&E's rate schedule E-1 would apply to each and every customer's monthly bill, regardless of the customer's usage. This is appropriate since the fee is collecting a portion of the fixed costs that do not vary with usage. In contrast, the minimum bill amount artificially "bumps up" different low usage customers' bills by different amounts. In the example above, a customer with zero usage has its bill increased by \$4.50 for a total bill of \$4.50, while a customer using 10 kWh would have its bill increased by just \$3.18 (to get to the same \$4.50 total bill). Put another way, both customers pay the same total bill of \$4.50 even though the second one (under the minimum bill) should pay more since it is getting the benefit of 10 additional kWh.

Finally, it should be noted that one of the fundamental principles of cost accounting and rate design, generally, is to recover fixed costs through a fixed charge, and variable costs through a variable charge. Even if a high minimum bill were established, it would follow that in the absence of a fixed customer charge, the regular variable charge per kWh would inappropriately have to “roll in” recovery of fixed costs, as occurs today. In effect, this establishes a portion of the total variable charge per kWh that on a class average basis must be set to recover those fixed costs. As a consequence, customers with usage higher than the class average will “overpay” for those fixed costs, and customers with usage below the class average will “underpay” for those fixed costs.

Surveys of other utilities establish that including fixed charges such as monthly fixed fees in residential rates are a wide-spread, well-accepted practice. Although PG&E’s Rate Design Reform Proposal begins with a modest monthly service fee at a fraction of the actual fixed costs of service, implementation of the monthly service fee over time will make PG&E’s residential rates more consistent with those of other utilities. Of 22 top utilities nationwide, 21 have monthly charges that exceed \$3.00 a month. Among California utilities, SCE has a monthly service fee, as do eight out of 16 municipal utilities operating in northern and central California.<sup>71</sup> For example,

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<sup>71</sup> Sacramento Municipal Utility District (SMUD), Silicon Valley Power, and Redding Electric Utility all have customer service fees, ranging from \$2.50 per month to \$12.50 per month. At the CPUC’s November 14, 2012 Energy Policy Conference on Energy Rate Design, Scott Martin of SMUD publicly stated that SMUD has been collapsing tiers since the year 2000 and recently eliminated its third tier, and that it is implementing increases to its fixed monthly customer charge by \$2 a year over the next five years, ramping up from its current \$12 monthly service fee to a \$20 monthly service fee, with corresponding decreases in energy costs. In addition, SMUD’s more recent plan includes moving to non-tiered residential flat rates during the 2014 to 2017 period.

SMUD charges \$12.00 per month for non-CARE customers and \$3.50 per month for CARE customers.<sup>72</sup>

Setting a monthly service fee to recover at least a portion of the fixed costs of serving residential customers (which costs do not vary with usage) on a fixed basis appropriately reflects cost causation, and supports more equitable recovery of PG&E's fixed costs among customers. These costs should be paid by all customers, as opposed to avoided by some and thus shifted to and paid by others.

### **2.1.5. PG&E's Rate Design Reform Proposal Provides Customers with Simpler, More Understandable Rate Options**

PG&E's Rate Design Reform Proposal leverages customer research conducted over the past several years that has helped define what residential customers believe would be understandable and simple in regard to electric rate plan options. Customer input has made it clear that "understandable" and "simple" are two closely related characteristics of a rate plan. One focus group participant summed it up very well:

*"It is obviously important that I can understand how my rate plan and my energy use behavior translates to my bill, however, I don't want to have to spend much time or effort figuring it out or have to work too hard to make the changes."<sup>73</sup>*

At first, it may seem that it is only important that a customer is capable of understanding their rate structure and how that structure affects their bill. However, from a customer engagement perspective, rate plan options need to be easy to understand as well as to act upon. Residential rate design in California has strived for

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<sup>72</sup> In addition to monthly fixed charge that is lower than on its standard rate, SMUD's low-income rate also features a 35 percent discount on Tier 1 usage and a smaller, 30 percent, discount on Tier 2 usage. However, once a customer's monthly usage reaches 600 kWh, there is no discount on additional kWh consumed. See SMUD's Residential and General Service Energy Assistance Program tariff (<https://www.smud.org/en/business/customer-service/rates-requirements-interconnection/documents/1-EAPR.pdf>).

<sup>73</sup> PG&E Residential Rates Language Focus Groups, King Brown Partners, January, 2013.

years to encourage energy conservation and peak load shifting. However, in order for customers to demonstrate these behaviors, their rate plan options have to not only be understandable, but be easy to understand and allow bill savings from easy changes in behavior.

Simplifying the standard rate from four tiers to two tiers and completely eliminating tiers in optional TOU rates will increase customer ability to understand how energy use behavior affects bills. The recently completed April, 2013, joint utility customer survey showed that customers on the current four-tiered rate have a very poor understanding of how their energy use behavior impacts their bills.<sup>74</sup> Results also show that customers prefer simpler rate structures, such as flat, two-tier and two-period TOU rather than structures with more tiers, more TOU periods and worse, more periods combined with more tiers.

PG&E's Proposal incorporates these customer perspectives by simplifying the standard rate from four tiers to two, and introducing a meaningful opt-in TOU rate without tiers. These new rate plans will eventually completely replace the current four-tier standard rate and the optional four-tiered TOU rate.

## **2.2. PG&E's Electric Rate Design Reform Proposal is Based on Marginal Cost and Cost-Causation Principles**

The CPUC has long stated that a fundamental principle of electric rate design is to charge customers rates that reflect utilities' cost of service.<sup>75</sup> More recently, the CPUC reaffirmed this principle in this proceeding:

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<sup>74</sup> "RROIR Customer Survey Findings," Hiner and Partners Inc., April 16, 2013.

<sup>75</sup> See, e.g., D.92549, 5 CPUC 2d 39, 108; D.93-06-087, 50 CPUC 2d 1; D.96-04-050, 65 CPUC 2d 362, 383-385.

*Importantly, D.08-07-045 adopted a set of guiding principles for the Commission and utilities to utilize in designing dynamic rates. These principles are:*

- 1. Rates should be based on marginal cost;*
- 2. Rates should be based on cost-causation principles;*
- 3. Rates should encourage conservation and reduce peak demand;*
- 4. Rates should provide stability, simplicity and customer choice; and*
- 5. Rates should encourage economically efficient decision-making.*

*Even though the decision did not explicitly state that equity is a guiding principle, the decision did note “that rates based on marginal cost will simultaneously achieve economic efficiency and equity by ensuring that customers’ rates are commensurate with the costs they cause. Marginal cost-based rates should effectively eliminate cross subsidies between customers since a customer who is less expensive to serve would pay less, and vice-versa for a customer who is expensive to serve.”<sup>76</sup>*

As the consumer group TURN also has stated, the policy underpinnings for these principles are that an “additional amount of economic efficiency arises” from a cost-based revenue allocation and rate design.<sup>77</sup> Not only is it fair and equitable for customers' rates to align as closely as possible with the cost to provide them with electric service, but doing so sends customers a price signal that helps them make more efficient choices regarding their energy usage. Note, however, that having more “cost-based” rates does not preclude the limited use of subsidies to internalize “social” or other “external” costs in rates, as long as those “social” costs are clearly and transparently communicated to customers, so that customers know precisely what they are paying for.

By transitioning residential electric rates closer to average and marginal cost of service over time, PG&E’s Rate Design Reform Proposal complies with the CPUC principle that rates should be based on marginal cost and cost-causation principles.

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<sup>76</sup> R.12-06-013, pp. 10-11.

<sup>77</sup> See A.12-02-020 (PG&E’s 2012 RDW), TURN, Marcus, Record Transcript, p. 318, lines 8-17.

Although the calculation of marginal costs will vary from rate case to rate case, no longer will PG&E's Residential Rate Design include rates for moderate- and higher-usage that exceed those actual costs by 100 to 200 percent, as they have for most of the last decade. Nor will rates for low usage and CARE customers fall significantly below their actual costs. Instead, CARE and baseline rates will be returned to their original objectives of helping low income customers pay their energy bills, and ensuring that all residential customers regardless of income pay a reasonable rate for basic electricity needs.

None of this will happen overnight, and PG&E intends to propose transitions for both CARE and non-CARE baseline rates that fully take into account that affordability of a basic quantity of electricity for essential residential customer needs is a fundamental element of California ratemaking. But "affordability" itself must take into account the fundamental fairness and equity of cost-of-service ratemaking. Under cost-of-service ratemaking, it is not fundamentally fair for one set of residential ratepayers to pay a rate that is higher than their cost of service in order to subsidize the electricity consumption of other ratepayers at below their cost of service – that is more generally the function of the elected Legislature through the broader based, more transparent system of taxation for the public good. Residential rate design is just not a good policy tool for addressing income-based affordability issues. In more colloquial terms, "fairness" and "equity" in public utility ratemaking mean that customers "pay only for what they get" and "get only what they pay for." Certainly, neither the CPUC nor public utilities under its jurisdiction have designed electric rates to business, agricultural and governmental customers on an "inclining block" tiered structure that punishes them with above-cost rates at higher

usage levels. The same cost of service principle applies to residential electric rates as well.

At a time when California's energy and environmental policies are requiring that all public utility customers pay their fair share of the costs of environmental externalities, such as reducing greenhouse gas emissions through AB 32's "cap and trade" program and reducing overall environmental emissions through the Renewable Portfolio Standard, PG&E's Rate Design Reform Proposal will fairly and equitably spread these costs based on the rate design principle of cost causation and marginal cost.

### **2.3. PG&E's Electric Rate Design Reform Proposal Encourages Conservation, Energy Efficiency, and Reduction of Both Coincident and Non-Coincident Peak Demand**

PG&E's Rate Design Reform Proposal will encourage greater energy conservation and energy efficiency, as well as reductions in both coincident and non-coincident peak demand, contrary to the "conventional wisdom" about the effects of inclining block rates and customer charges.<sup>78</sup>

Proponents of steeply inclining tiered rates often tout their ability to encourage conservation by providing very high price signals in the upper tiers. While this may be the conventional wisdom, one cannot just focus on the rates in the upper tiers. The fact is that tiered rates also provide very *low* price signals in the lower tiers where the vast majority of the usage occurs (slightly more than two-thirds, for PG&E). So, compared to a flat rate structure, inclining block rates reduce usage in the upper tiers but increase usage in the lower tiers. It is an empirical question which of these two effects dominates the other, and thus whether inclining block rates really reduce overall usage.

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<sup>78</sup> In other customer sectors, these concerns do not seem to be apparent. None of PG&E's non-residential rates are tiered, and all of them have monthly fixed fees.

So PG&E's Proposal here to move to a flatter residential rate structure – one with just two tiers instead of four, and with a relatively modest differential between the two rates – is not necessarily “anti-conservation” as the conventional wisdom might suggest and may, in fact, do more to encourage *overall* conservation in the residential class.

There is a similar misconception about the effects of a monthly fixed fee / customer charge. Since the introduction of a customer charge will reduce the level of volumetric rates (since the overall revenue to be collected is unchanged), the conventional wisdom suggests that this will reduce customers' incentives to conserve. But this theory assumes that residential customers respond to marginal prices (i.e., the price in the tier in which they are currently consuming) when making decisions about whether to consume an additional kWh. Recent research by Ito and Borenstein at the University of California, though, has shown this assumption does not seem to hold true in practice.<sup>79</sup> Rather, the research strongly suggests that customers respond to average rates rather than marginal rates. The addition of a customer charge will increase the average rate paid by customers in the lower tiers and decrease the average rates in the upper tiers.<sup>80</sup> So, once again, while upper tier consuming households will have a reduced incentive to conserve, lower tier consuming households

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<sup>79</sup> Koichiro Ito, "Do Consumers Respond to Marginal or Average Price? Evidence from Nonlinear Electricity Pricing" (Revised October 2012), Energy Institute at Haas, [http://ei.haas.berkeley.edu/pdf/working\\_papers/WP210.pdf](http://ei.haas.berkeley.edu/pdf/working_papers/WP210.pdf).

<sup>80</sup> The reduction in the average rate is due to PG&E's proposal to use the additional revenues from the customer charge primarily to reduce upper-tier rates. For households consuming in the upper tiers, the bill-reducing effect of these rate reductions will more than offset the bill-increasing effect of the customer charge. For households consuming in the lower tiers, though, the bill-increasing effect of the customer charge will dominate, resulting in higher bills and average rates.

will have an increased incentive, and it is an empirical issue which of these effects dominates the other.<sup>81</sup>

There are two other aspects of PG&E's Proposal besides flattening the tier structure and introducing a customer charge. First, PG&E is proposing a reduction in the CARE discount over time. Since CARE rates have declined in real terms over the last two decades, there has been a reduction in the incentive for CARE households to conserve. PG&E's Proposal will begin to provide a conservation signal that has long been absent for these households. Second, PG&E is proposing to transition to an optional non-tiered TOU rate option. TOU rates are generally focused on providing an incentive for customers to shift their loads from higher-priced on-peak periods to lower-priced off-peak periods, and not necessarily on reducing overall usage. But even if usage does not increase overall, an environmental benefit is obtained from being able to reduce power production and purchases in the on-peak periods where less efficient generators are being used and increase production and purchases in the off-peak periods where generation is more efficient.

Given the preponderance of sales in the lower tiers (and to CARE households) compared to the upper tiers, the pro-conservation effects of PG&E's Proposal to raise average rates in the lower tiers (and to CARE households) and to lower them in the upper tiers might well be expected to reduce overall residential usage, or at least leave it at about the same level. In Chapter 4, PG&E describes its work estimating the effect of its rate proposals in their entirety on overall residential usage. As described there,

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<sup>81</sup> With tiered rate structures, average rates vary with a customer's usage, rising slowly with each additional kWh assumed (and approaching the upper tier rate asymptotically as usage goes to infinity). In contrast, with a flat rate design the average rate is the same regardless of the amount of kWh consumed. So the same effect is seen when evaluating PG&E's Proposal to flattening the tiered rate structure – lower tier consuming households will have a greater incentive to conserve, while higher tier consuming ones will have a smaller incentive to do so.

these empirical results show that PG&E's Proposal will result in modest reductions in overall residential usage, assuming reasonable estimates of customers' price elasticities of demand.

In addition, PG&E's simpler, more understandable non-tiered TOU rate design will open up new opportunities and new incentives for all of PG&E's residential customers to choose new electric rate plans that encourage them to shift their energy use to non-peak periods and save money doing so. These new TOU and demand response rate schedules and programs will directly encourage customers to reduce their coincident demand for energy on PG&E's system when resources are most scarce and costs are the highest.

For several years, PG&E has repeatedly emphasized that the current tiered residential electric rate structure is the primary obstacle to successful implementation of "customer-friendly" TOU residential electric rates for PG&E's customers that directly incent load shifting from higher cost to lower cost periods. If PG&E's Rate Design Reform Proposal is approved, this major barrier to successful TOU rates will be removed.

#### **2.4. PG&E's Electric Rate Design Reform Proposal Enhances Customer Choice**

As discussed above, an important objective of PG&E's Rate Design Reform Proposal is to *enhance customer choice* through new, *simple, easy to understand* customer rate and billing options. PG&E's Rate Design Reform Proposal applies extensive "lessons learned" including those from SmartMeter™ roll-out and PG&E's highly-subscribed SmartRate program (with over 100,000 customers currently enrolled). Based on those lessons-learned, PG&E is proposing a simple set of electric rate options for residential customers that are easier to understand, transparent in design, and

simple to compare regarding current impacts on bills and time of use. In addition, PG&E's Proposal includes robust customer outreach and education as part of the transition from the existing, complex rates to the new, simpler rate structure. PG&E's Proposal is based on extensive customer research and direct solicitation of our customers' views conducted over the last five years, including the specific customer research conducted for this proceeding.

In addition, given the simplicity of PG&E's new rate design, it is a stable framework for the future and can take into account changes and increased customer sophistication and use of customer-directed energy management tools, such as Green Button Connect, two-way demand response communications tools, and Home Area Network devices. This is because PG&E will be offering customers a clear and stable choice between simple two-tiered and non-tiered TOU rates, while preserving a limited number of additional residential rate options that meet specific customer needs, such as electric vehicle, "Green Option" and CARE rates.

### **2.5. PG&E's Electric Rate Design Reform Proposal Provides Explicit and Transparent Incentives and Encourages Economically Efficient Decision-Making. In So Doing, PG&E's Electric Rate Design Reform Proposal Avoids Unnecessary Cross-Subsidies**

Simply stated, economically efficient decision-making requires that prices be based on marginal costs, and that subsidies be minimized. PG&E's Rate Design Reform Proposal supports these principles by returning residential electricity prices to cost-based rates after over a decade of distorted, inefficient below-cost and above-cost pricing to millions of PG&E customers. PG&E does not propose to return electricity prices immediately to more cost-based rates, because an adequate and reasonable transition period is needed in order to help customers adjust to these more cost-based

rates. However, PG&E intends that the transition period be short enough to avoid unnecessarily extending the period of large cross-subsidies that now has lasted more than a decade. At the same time, PG&E's Rate Design Reform Proposal will maintain a "social safety net" in electric rates through continuation of the CARE program and a baseline rate for a baseline quantity of electricity for residential customers.

## **2.6. PG&E's Electric Rate Design Reform Proposal Helps Achieve California's High Priority Energy and Environmental Goals**

As discussed in the sections above, PG&E's Rate Design Reform Proposal returns residential electric rates to cost-based rates over a reasonable transition period, thus providing economically efficient price signals to customers while maintaining a necessary "social safety net" for low income and baseline customers. In so doing, PG&E's Electric Rate Design Reform Proposal substantially enhances the achievement of California's energy and environmental goals. This is because, over a gradual transition period, millions of PG&E's customers whose electricity rates have excluded the real costs of energy for over a decade, will now see the accurate price signals and costs of California's energy resources, including both the internal and external costs of carbon-based resources. In turn, these more accurate price signals will for the first time in over a decade provide millions of PG&E's residential customers with actionable incentives to install energy efficiency measures and customer-owned generation facilities that reflect California's energy and environmental policies.

PG&E's review of recent research on economically efficient energy pricing indicates that PG&E's Rate Design Reform Proposal is likely to result in greater energy

savings on a net basis compared to the status quo of tiered electric rates.<sup>82</sup> These net savings will be in addition to the additional benefits PG&E expects from simplifying the residential rate structure so that customers and third-party energy conservation application developers can better understand and offer cost-saving technologies and measures.

## **2.7. PG&E’s Electric Rate Design Reform Proposal Makes Appropriate Trade-Offs Among Rate Design Principles**

If based solely on the core rate design principles of cost-based and equitable rates, PG&E’s residential rates should be transitioned immediately to cost-of-service rates, because electricity prices based on cost are the optimum means of ensuring that all customers pay non-discriminatory and economically efficient prices for energy . However, PG&E’s Rate Design Reform Proposal takes into account that social costs and benefits also need to be considered in designing utility rates. Accordingly, PG&E’s Rate Design Reform Proposal includes certain trade-offs from cost of service ratemaking. These trade-offs include:

- PG&E’s Rate Design Reform Proposal retains rate assistance under the CARE program in order to provide income assistance to help low income customers pay their energy bills.
- PG&E’s Rate Design Reform Proposal retains a “baseline quantity” of electricity that is priced below cost, in recognition that sufficient quantity of

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<sup>82</sup> In Application 10-03-014 (PG&E’s 2011 GRC Phase 2), the CPUC received into evidence testimony that included an analysis by Dr. Ahmad Faruqui, who concluded that, taken as a whole, PG&E’s proposals in that proceeding would provide a pro-conservation signal, and should be expected to produce a net decrease in energy sales of nearly 166,000 MWh per year. (PG&E, Faruqui, Exhibit PG&E-1, p. 11-9, lines 11-14.) This occurs largely because CARE customers will have stronger incentives to use less energy under the proposed rate design, while the use by non-CARE Tier 4 customers increases only marginally. (*Id.* lines 15 – 20.)

electricity at a lower price is a basic necessity for all of PG&E's residential electricity customers.

- PG&E's Rate Design Reform Proposal retains a two-tier residential electric rate structure in which the upper tier price is somewhat higher than the cost of service.
- PG&E's Rate Design Reform Proposal includes a reasonable transition period, in recognition that customers need time and adequate information and education to understand and then make informed decisions on the new residential rate choices that are made available to them.

PG&E supports these trade-offs as a reasonable departure from cost-of-service ratemaking, because the trade-offs are consistent with California's energy, environmental and social policies that our customers and California's policymakers generally support and expect.

## **2.8. PG&E's Electric Rate Design Reform Proposal Takes Into Account Uncertainties in Customer Preferences, Wholesale Electric Prices, and Economic Conditions**

PG&E's Electric Rate Design Reform Proposal explicitly takes into account uncertainties in customer preferences and energy markets generally. PG&E's extensive customer research indicates that customers support the "simple is better" approach in PG&E's Proposal. However, PG&E intends to conduct additional customer research periodically, in order to assess and update our understanding of customer preferences and needs. In addition, PG&E's TOU and two-tiered residential rate offerings are consistent with wholesale electricity market price behavior. As discussed above, PG&E also has taken into account the evolving reforms and improvements in the CARE low income assistance program, particularly the growing recognition that a "one-size-fits-all"

CARE rate discount is not an efficient means of targeting assistance to low income customers.

The key public policy lesson of over a decade of tiered and frozen residential electric rates is that *electric utilities must continuously reassess and understand the changing preferences and needs of their residential customers*, and quickly adapt their electric rates and services to those changes. PG&E’s Rate Design Reform Proposal includes this “lesson-learned” as a core principle.

## **2.9. PG&E’s Electric Rate Design Reform Proposal Enables Time-of-Use Pricing and Other New Customer-Facing Technologies, Tools, Products and Services for Managing Energy Use**

PG&E’s Electric Rate Design Reform Proposal fully integrates and enables customer-facing technologies and tools that are being developed and offered by third parties “beyond the meter.” These technologies and tools are particularly effective if rates are simple, easy to understand, and vary by time of use. PG&E’s customer research indicates that its residential electricity customers spend very little time on their bills or in actively managing their energy use, but do respond to new tools, devices and technologies that reduce their energy bills through “set it and forget it” applications. PG&E’s Rate Design Reform Proposal is intended to enable greater customer control of their own energy usage, through simpler rate designs and greater access to customer energy usage data through PG&E’s Green Button, HAN and Customer Data Access programs.

## **2.10. PG&E’s Electric Rate Design Reform Proposal Requires Legislative Changes to Fully Implement**

Current laws, particularly SB 695, prevent the CPUC from adopting changes to residential electric rate designs in order to address the grossly unfair and inequitable

disparities in current electric rates. Changes in these restrictive laws, such as by adoption of the rate reforms in AB 327 (Perea), are essential in order for PG&E to implement its Rate Design Reform Proposal.

As PG&E noted in its recent 2014 Phase II General Rate Case application, although it is important to do what is possible now to mitigate the high upper-tier non-CARE rate problem, approval by the Commission of all of PG&E's 2014 Phase II proposals would still leave PG&E's top tier rate at 28.9 cents per kWh – far above PG&E's average residential rate of 16.8 cents per kWh.<sup>83</sup> While an improvement, this top tier rate is still too high, and the gap between the Tier 2 and the proposed merged Tier 3/Tier 4 rate is still too large and inconsistent with Public Utilities Code Section 739(d)(1)'s requirement of an appropriate, "gradual [tier] differential." Steep upper tier rates that are far above the average cost to serve are inequitable and cause high bills and unnecessary bill volatility for those whose usage moves into the higher tiers.

Legislation adopting structural reform is needed to remove the constraints that currently limit the Commission from making further progress toward a simpler tier structure with a more appropriate gradual rate differential. In particular, at a minimum the constraints on rate design reform in Public Utilities Code Sections 739.1 and 739.9 need to be removed, as proposed by AB 327 (Perea). In addition, the application of the baseline statute (Public Utilities Code Section 739) and the low income rate assistance statute (Public Utilities Code Section 382) need to be harmonized and, if necessary, revised to ensure clear, transparent, efficient assistance to low income ratepayers to help them pay for basic electricity needs. If and when such structural reforms are

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<sup>83</sup> Pacific Gas and Electric Company's 2014 General Rate Case Phase II Prepared Testimony (A.13-04-012), Exhibit (PG&E-1), Volume 1, Revenue Allocation and Rate Design, Table 3-6 (at p. 3-11).

enacted, the Commission will once again have the flexibility to make more substantial progress toward solving the high upper tier rate problem and more fairly distribute costs of service among residential customers as proposed by PG&E's Rate Design Reform Proposal. Only then would it be possible, over a reasonable period as proposed by PG&E, to return residential rates to the two tier structure with close to the 15 percent differential that existed before the energy crisis.

### **2.11. PG&E's Electric Rate Design Reform Proposal Will Adapt Over Time to Changing Load Shapes, Changing Marginal Electricity Costs, and Changing Customer Preferences**

PG&E's Rate Design Reform Proposal will adapt to changes in load shapes and marginal costs, because PG&E is not proposing changes to the CPUC's traditional methods for calculating and allocating marginal costs and for designing TOU rates that provide understandable, actionable incentives for customers to reduce their electricity demands coincident with peak demands on PG&E's system. As part of the design and adaptation of PG&E's residential rate design, PG&E will take into account the increasingly sophisticated tools for forecasting short-term electricity demands by its residential customers, using interval SmartMeter™ consumption data and Smart Grid tools such as those being tested and demonstrated under PG&E's Smart Grid Pilot Deployment Project, EPIC demonstration projects, and the California Energy Systems for the 21<sup>st</sup> Century project.<sup>84</sup>

### **2.12. PG&E's Electric Rate Design Reform Proposal Will Promote the Safety of Electric Customers, Employees and the Public**

PG&E and other California electric utilities need to make extensive investments over the next decade to improve the reliability and safety of their electric distribution and

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<sup>84</sup> See, e.g., D.13-03-032, D.12-12-031, D.12-05-037.

transmission systems.<sup>85</sup> In addition, extensive investments are needed to enhance security of the Information Technology (IT) and other communications systems that ensure safe and reliable operation and maintenance of the electric grid.<sup>86</sup>

PG&E's Electric Rate Design Reform Proposal will promote these overarching safety and reliability goals, because it enhances the trust and confidence of customers that they are paying a fair and accurate price for these infrastructure investments. In addition, PG&E's Rate Design Reform Proposal provides customers with easier to understand choices. By including a rate design that fairly allocates the fixed and accurate costs of supporting customer-owned generation, PG&E's rate design ensures that both PG&E and customers see economically efficient price signals to support the safe and reliable operation of the grid as a "backup" to customer-owned generation.

### **2.13. Conclusion – PG&E's Rate Design Reform Proposal Complies with the Commission's Optimal Rate Design Principles and Addresses the Commission's Questions**

As described above, PG&E's Rate Design Reform Proposal fully complies with the Commission's principles for optimal residential rate design, including the core principles of cost-based and economically efficient rates and reasonable assistance to help low-income customers manage their energy burdens.

In addition, as discussed in Chapter 3, below, PG&E's Rate Design Reform Proposal is supported by the customer research conducted by PG&E and the other utilities in this proceeding.

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<sup>85</sup> See, e.g., PG&E A.12-11-009, 2014 General Rate Case, Phase 1.

<sup>86</sup> See, e.g., PG&E Smart Grid Deployment Plan, 2011-2020, R.08-12-009, June, 2011.

### **3. CHAPTER THREE: Customer Research Regarding PG&E's Electric Rate Design Reform Proposal**

#### **3.1. Summary of Customer Research Key Findings for Rate Design**

PG&E has considered these findings from the customer research in its electric rate design proposal, in balance with the other key rate design principles:

- Customers should be offered choices:
  - The majority indicate willingness to consider switching
  - Those that have opted-in to TOU rate plans are more satisfied than those who have been defaulted to a TOU rate plan
- Even though some customers may not want to consider new rate options, education and especially bill protection can significantly increase willingness.
- Although the majority of customers may not prefer a TOU rate compared to a simple tiered rate, they are already practicing the concept of shifting usage to off peak times.
  - There remains a significant group of customers that are interested in switching to TOU rates.
- kWh prices will be a more important customer consideration than rate structures themselves.
  - Customers will take tier and period kWh price differentials into consideration when choosing among rates to help them save on their bill.
- Based on rate structure alone:
  - Customers will be attracted to simpler structures, primarily flat rate, two-tier and two-period TOU rate.

- Three-tier and three-period TOU rates will be least attractive.
- Although customers will tend to avoid monthly service fees in an optional rate, this negative effect may be mitigated by
  - A simple rate structure and attractive kWh pricing, and
  - A similar customer service fee on the standard rate.
- The transition strategy should take into consideration tolerance for bill impacts, especially for low-income customers.

PG&E's bill calculator and some typical illustrative bill-to-income impacts of various Rate Design Reform Proposals are discussed in Chapter 4, below.

### **3.2. Customer Research Genesis and Scope**

PG&E believes that in order to develop appropriate rate design proposals in this proceeding, an understanding of customer perceptions of current and possible future rate structures and potential bill impacts needed to be considered. PG&E included this suggestion in its initial OIR comments, and at subsequent workshops the CPUC agreed that customer research should be pursued. PG&E then led a process in collaboration with the IOUs and other parties in the proceeding to design and launch the survey. The design/collaboration phase consisted of multiple webinars and individual meetings with other interested RROIR parties to collect and work to incorporate varying perspectives.

Hiner & Partners<sup>87</sup> was retained by PG&E, SCE and SDG&E to conduct the survey. The online survey of approximately 5,300 electric customers was fielded in February and March of 2013, through a market research panel company employing quotas to ensure the sample was representative of the IOU customer population.

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<sup>87</sup> Hiner & Partners is an experienced marketing diagnostics firm. See <http://new.hinerpartners.com/index.php/about-us>.

Please see Appendix A.1 for the key findings that were delivered to all interested RROIR parties by Hiner & Partners in a webinar on April 16, 2013.

### **3.3. Customer Research Objectives**

The principles of understandability, simplicity, stability, and choice are difficult to measure and customers can have very different definitions, so obtaining direct customer input was useful. Understanding customer attitudes and preferences for various rate structures helped to inform the development of PG&E's rate proposals in this document.

Specific survey objectives included:

1. Investigate current customer awareness and understanding of different rate structures and rate terminology.
2. Quantify and further identify how customer attitudes and understanding impact evaluation of rate structures such as flat, tiered and TOU, and components such as monthly service fees, demand charges and different kWh pricing structures.
3. Investigate how concepts such as “understandable,” “stable,” “predictable,” “choice,” “fair,” and “affordable” matter to residential customers to better inform rate transition/implementation strategies.
4. Determine customer preferences for different potential rate plan options across different customer groups. Customer groups included:
  - Core Sample: PG&E, SCE, SDG&E customers who were provided information or “education” about rate plan structures.
  - Regional: e.g., climate zone
  - Demographics: e.g., CARE vs. non-CARE, seniors vs. other age groups
  - Solar and non-solar

- Spanish-speaking
- “High involvement” customers, who were enrolled in programs requiring behavior change for bill savings (e.g., SmartRate)
- “Unexposed” customers that were not provided some level of education about the rate plan options provided in the survey.

See Appendix 2 for a detailed description of the survey methodology.

### **3.4. Results**

#### **Energy Use Behavior**

Customers continue to be confused by the relationship between rate structure, energy use behavior, and bill savings:

- 94 percent of the PG&E respondents have reduced usage to try to save money on their bill. However, only 42 percent knew they were on a tiered rate, which indicates a strong belief that there is a positive relationship between usage and bill amount, but not necessarily a good understanding of the compounding effect of increasing tier prices.
- 74 percent of PG&E respondents have shifted usage to try to save money on their bill. However, only 22 percent *believed* they were on a TOU rate, and less than 2 percent actually are on a TOU rate. A large group of customers think that shifting usage can save them money on their bill, but few understand that they must make an active choice for a rate plan option that rewards this behavior.

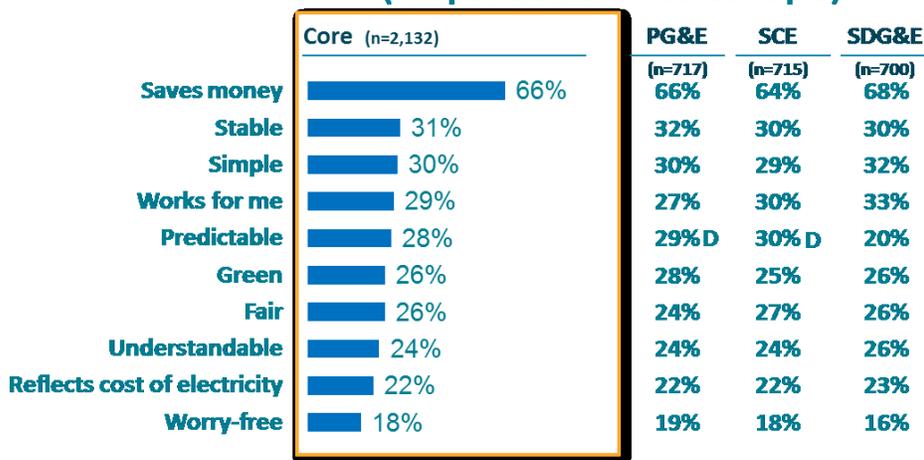
Not surprisingly, despite these widespread efforts aimed at lowering bills through reducing and shifting energy use, few respondents believed that these efforts have paid off:

- Only 15 percent believed they saved a lot of money from reducing usage
- Only 9 percent believed they saved a lot of money from shifting usage
- The combination of attempting to save through reducing or shifting with little change in the bill results in frustration and a lack of interest to make any additional efforts to change behavior in the future.

### Rate Plan Factor Importance

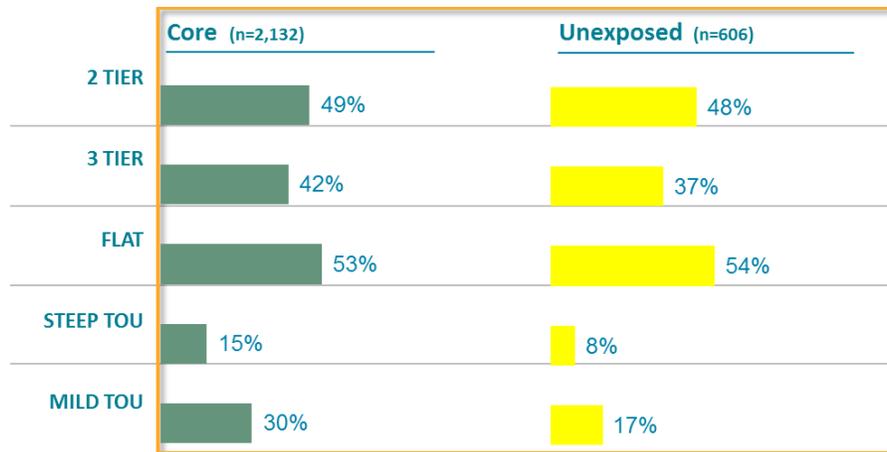
Respondents were asked to identify the most important factors they would consider when choosing among rate plans. Respondents overwhelmingly and consistently want a rate that will help them save money on their bill. Other important factors included “Stable,” “Simple,” and “Works for Me.” These results were very similar across IOUs. One particularly significant finding for PG&E was that non-CARE customers valued “Green” much more than CARE customers (30 percent vs. 19 percent). Please see Appendix A.3, Customer Survey, Q3.7 for specific language used to describe these different factors considered when choosing rate plans.

### Important Factors When Choosing Rates (Respondents indicated top 3)



## Willingness to Try New Rate Plans and the Effect of Rate Education

About 50 percent of Core respondents said they were willing to try a two tier or flat rate plan. Core respondents were provided “rate education” that included substantial explanation of how alternative rate structures, components (such as monthly service fees, demand charges, and different kWh pricing structures) and energy reducing and shifting behaviors could impact their bill. In order to investigate the importance of rate education, a sub-group of 600 unexposed respondents were not provided rate education before questions about rate preferences. Rate education made little difference in willingness to try two tier, three tier and flat rate plans. However, respondents who were provided rate education were almost twice as willing to try TOU rates. In fact, after rate education, 30 percent of respondents said they would be willing to try a mildly time-differentiated TOU rate.



After respondents indicated their willingness to try different types of new rate plans, they were asked about the amount of bill savings they would expect when faced with the potential for a bill increase as well. Forty percent said they were not willing to risk a higher bill for the opportunity of bill savings. Nonetheless, there was a sizable

group of respondents (23 percent) that indicated willingness to risk a bill more than 15 percent higher for the potential of a commensurate bill decrease.

### **Tolerance for Bill Impacts**

In order to better understand customer tolerance for bill impacts that might result during the transition to a reformed rate structure, respondents were asked:

*When your electric bill is more than the average amount or what you were expecting, how much of an increase gets your attention?*

Responses to this question provide insight into bill impact mitigation during the transition period.

For about one-third (36 percent) of Core respondents, a monthly bill increase of less than \$20 per month catches their attention. The median bill increase that respondents said they notice was in the \$20-\$29 range, which, when compared to the median summer electric bill, is in excess of 20 percent of the total bill. CARE customers reacted to smaller bill increases, but their median summer bills are lower, so they also respond to changes in excess of 20 percent of the total bill.

### **Effect of Bill Protection**

Respondents were asked if their willingness to try a new rate plan structure would change if they were provided with twelve months of bill protection (“Try Before You Buy” or “TBYB”), which would credit them for any bill increases during their first year on the new rate plan. TBYB was particularly beneficial in encouraging respondents to try TOU rates. With TBYB, there was a 73 percent increase in Core respondent willingness to try a mild TOU rate (from 30 percent to 52 percent), and a 133 percent increase in willingness to try a steep TOU rate (from 15 percent to 35 percent). This impact was even greater with the unexposed respondents that had not been provided rate education. Unexposed respondents willingness to try a mild

TOU rate increased 141 percent with TBYB (from 17 percent to 41 percent) and 325 percent for a steep TOU rate (from 8 percent to 34 percent).

### **Rate Plan Attribute Importance**

A choice modeling exercise and conjoint analysis was used to build a model that simulates different rate plan option “baskets.” (See Appendix A.2 – Customer Research Methodology, for more explanation of conjoint analysis.) Respondents were shown twelve randomly generated conjoint choice tasks. Each choice task was comprised of three discrete choice options. The conjoint methodology resulted in about 82,000 Core respondent choice tasks that revealed relative preferences for rate plan structures, kWh pricing, and other types of fees. Analysis of these responses showed that three attributes were most important when respondents made choices:

- Monthly service fees and price per kWh levels were the **most** important attributes impacting choice of rate plans.
- Rate structure itself was a bit less important, but still an important factor in the decision. Respondents preferred simpler rate plans:
  - Respondents preferred flat and two tier rate plans the most
  - Respondents preferred three-period TOU rate plans and three-tier rate plans less.

### **Experience in Other Jurisdictions**

Respondents were surveyed in two North American jurisdictions outside California where there are significant numbers of residential customers on TOU rates. In Arizona, Arizona Public Service (APS) and Salt River Project (SRP) have moved 30 percent to 40 percent of their residential customers onto optional TOU rates. This migration has occurred over two decades. SRP, for example, reached about 20 percent

penetration in the first ten years, and now close to 30 percent of its residential customers are on TOU rates.

In Ontario, Canada, Hydro One has moved almost all of its residential customers onto a mandatory TOU rate over the past several years.

An interesting observation about the two jurisdictions that have a large portion of their residential customers on TOU rates is that their customer satisfaction levels are significantly higher where customers are given an optional TOU rate versus a default or mandatory TOU rate. Hydro One respondent satisfaction levels were very low, while the Arizona respondent satisfaction levels were quite high. While there are many factors that ultimately go into utility satisfaction scores, this data provides credible evidence about how rates and satisfaction can be linked.

	SRP/ APS	Hydro One	CA IOU Core
<b>Satisfaction (Top 3 Box)</b>			
<b>Availability of Meaningful Rate Plan Options</b>	63%	23%	41%
<b>Timely Rate Change Communications</b>	51%	28%	41%
<b>Rate Plan Education</b>	48%	19%	33%
<b>Fair Price</b>	41%	12%	32%
<b>Keeping the Lights On</b>	80%	41%	64%
<b>Highly Satisfied with Utility</b>	76%	37%	59%

APS/SRP respondents were generally the most satisfied with their utility. In addition, Hydro One respondents on mandatory TOU rates were not much more aware or knowledgeable about TOU rates than APS/SRP customers that have opted in to TOU rates over time. This represents little evidence that mandatory TOU rates successfully engage customers.

### **3.5. Conclusion**

Market research and recent experience have shown that current and future rate designs / options can have significant impacts on many customers. Customers want meaningful rate plan options, and are willing to change their behavior to lower their bills. In follow-up comments, survey participants also overwhelmingly indicated their interest in the topic of electric rates and how energy use translates to their bill. Considering customer preferences and attitudes is critical to the development of rate plan options that engage customers with their energy use while improving customer satisfaction and helping achieve State policy goals. In Chapter 4, "Typical Bill Impacts - PG&E Electric Rate Design Reform Proposal vs. Current Rate Structure," PG&E addresses how the transition to a new set of rate plan options will help customers manage bill impacts and make choices among different rate plans.

## **4. CHAPTER FOUR: Typical Bill Impacts PG&E Electric Rate Design Reform Proposal vs. Current Rate Structure**

### **4.1. PG&E's Bill Calculator Model**

In late 2012 and early 2013, PG&E developed its Bill Calculator Model to enable the CPUC's Energy Division and various parties to analyze various rate design scenarios and compare those with respect to the rate design principles described in the Residential Rate OIR.<sup>88</sup> The Bill Calculator Model uses the 2009 Residential Appliance Saturation Survey (RASS) data, merged with 2011 customer usage data, to design the rates and calculate the corresponding bill impacts for PG&E's Proposal.<sup>89</sup> The RASS data consist of 7,782 sample points covering all PG&E baseline territories. Using this customer sample, the bill calculator first determines the amount of revenue collected based on present rates. This revenue amount is then adjusted for the CARE subsidy amount to determine the revenue requirement with no CARE subsidy. The resulting revenue requirement is then used to design the rates of various non-TOU and TOU rate structures (referred to as "Proposed Scenarios"), calculate the bill amounts and CARE subsidies, and also estimate whether the particular rate structure results in the total amount of energy consumed decreasing (i.e., energy conservation) or increasing. In addition, the Bill Calculator Model determines cost-based bill amounts using marginal cost information for generation, transmission, distribution, and other charges. The cost-based bill amounts can be used as a benchmark against which to evaluate the cost basis of any proposed rate scenario. The Bill Calculator Model thus allows users to assess the extent to which a rate scenario serves the rate design principles.

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<sup>88</sup> *Administrative Law Judges' Ruling on Workshop*, R.12-06-013, January 31, 2013, pp. 4-5.

<sup>89</sup> The Bill Calculator allows bill impact evaluation of various rate design structures. PG&E's Proposal includes a two tiered non-TOU rate structure and a flat TOU rate structure.

## **4.2. Designing Rates With the Bill Calculator Model**

The Bill Calculator Model allows the user to develop various combinations of non-TOU and TOU rate designs. For example, non-TOU rate structures can be designed either as a single flat rate, or as a multi-tiered rate structure with up to five tiers. The user can also specify a design with a monthly fixed fee or a minimum bill amount. If a tiered rate structure is chosen, the user can specify the levels of the Tier 1 and Tier 2 rates or the rate differentials between different tiers' rates. The Bill Calculator Model processes these various input assumptions automatically and produces specific rate values as outputs. For TOU rates, the Bill Calculator Model can design rates with either two or three TOU periods. Details of the inputs and functionalities, and instructions for how to run the calculator, are described in the Bill Calculator User Manual.<sup>90</sup>

## **4.3. Proposed Rate Design**

As described in the Executive Summary, PG&E's Rate Design Proposal is for customers to have the choice between two basic rate plans:

1. A standard rate with two tiers and no TOU periods; and
2. An optional TOU rate without tiers.

Both the standard (tiered, non-TOU) and the optional (non-tiered, TOU) rate schedules would have a monthly fixed fee replacing the minimum bill amounts currently applicable to PG&E's residential rate plans. CARE customers would have a similar choice between a standard tiered rate and a non-tiered TOU rate, but with all rate components discounted by an explicit CARE discount percentage.

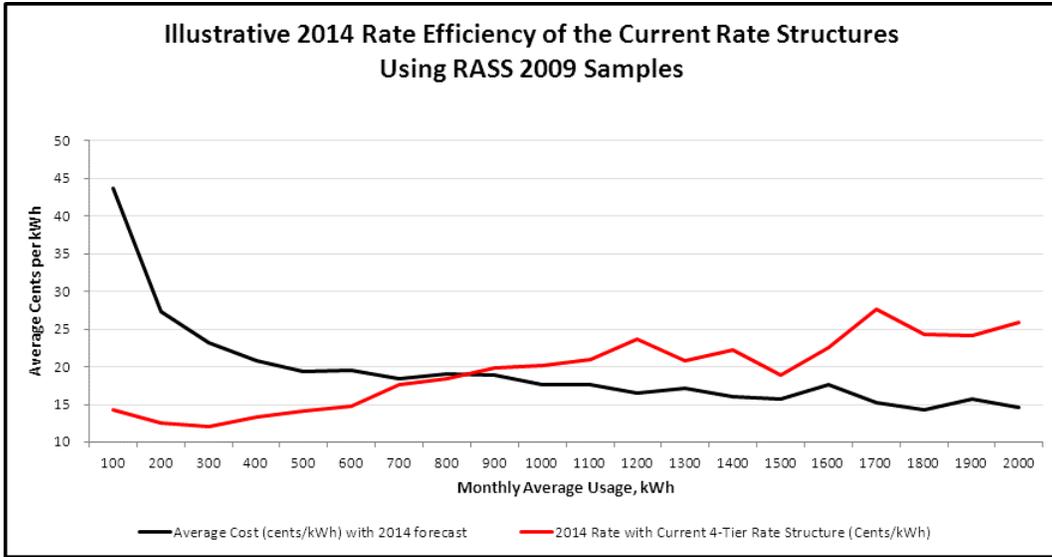
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<sup>90</sup> A copy of PG&E's Bill Calculator User Manual is attached as Appendix B.

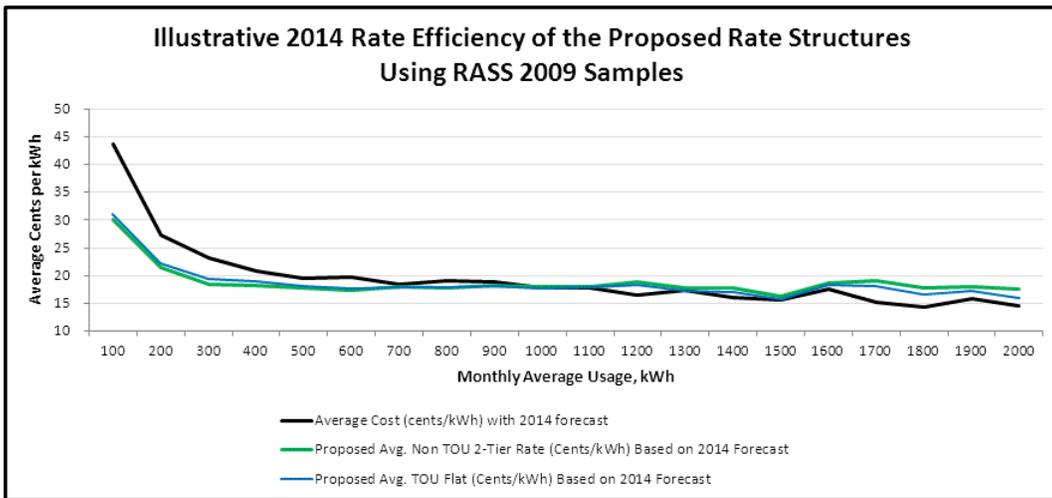
#### **4.4. Cost Basis of PG&E's End State Rate Design**

To illustrate how PG&E's proposed rate design represents an improvement compared to current rates in terms of more closely reflecting cost of service and "rate efficiency," PG&E used the Bill Calculator Model to calculate average rates for each rate option and compared them to average cost. In the figures below, PG&E used its 2014 average rate forecast (based on the marginal cost based calculation included in the Bill Calculator) as a proxy for average cost, to illustrate how the end state rates bear a better resemblance to cost basis as usage increases. As can be seen in Figures 4-1 and 4-2 below, the average cost (cents per kWh) shows an initially declining curve which moves to a finally near-flat shape relationship with the monthly average usage. In contrast, Figure 4-1 shows that, while the existing four-tiered structure has the average rate increasing with average monthly usage, PG&E's illustrative rate structures as shown in Figure 4-2 result in average rates declining with the monthly average usage in a way that is consistent with the average cost behavior. This demonstrates that PG&E's Rate Design Reform Proposal is more cost-based and more economically efficient when compared to the existing rates, as the shapes of those curves resemble the shapes of the cost-based rate curve more closely.

**FIGURE 4-1  
PACIFIC GAS AND ELECTRIC COMPANY  
ILLUSTRATIVE 2014 RATE EFFICIENCY OF THE CURRENT RATE  
STRUCTURES USING RASS 2009 SAMPLES<sup>91</sup>**



**FIGURE 4-2  
PACIFIC GAS AND ELECTRIC COMPANY  
ILLUSTRATIVE 2014 RATE EFFICIENCY OF THE PROPOSED RATE  
STRUCTURES USING RASS 2009 SAMPLES**



**4.5. Energy Conservation**

PG&E used the Bill Calculator Model to estimate the effects of its proposed end state rates on overall energy consumption, relative to the total consumption level that

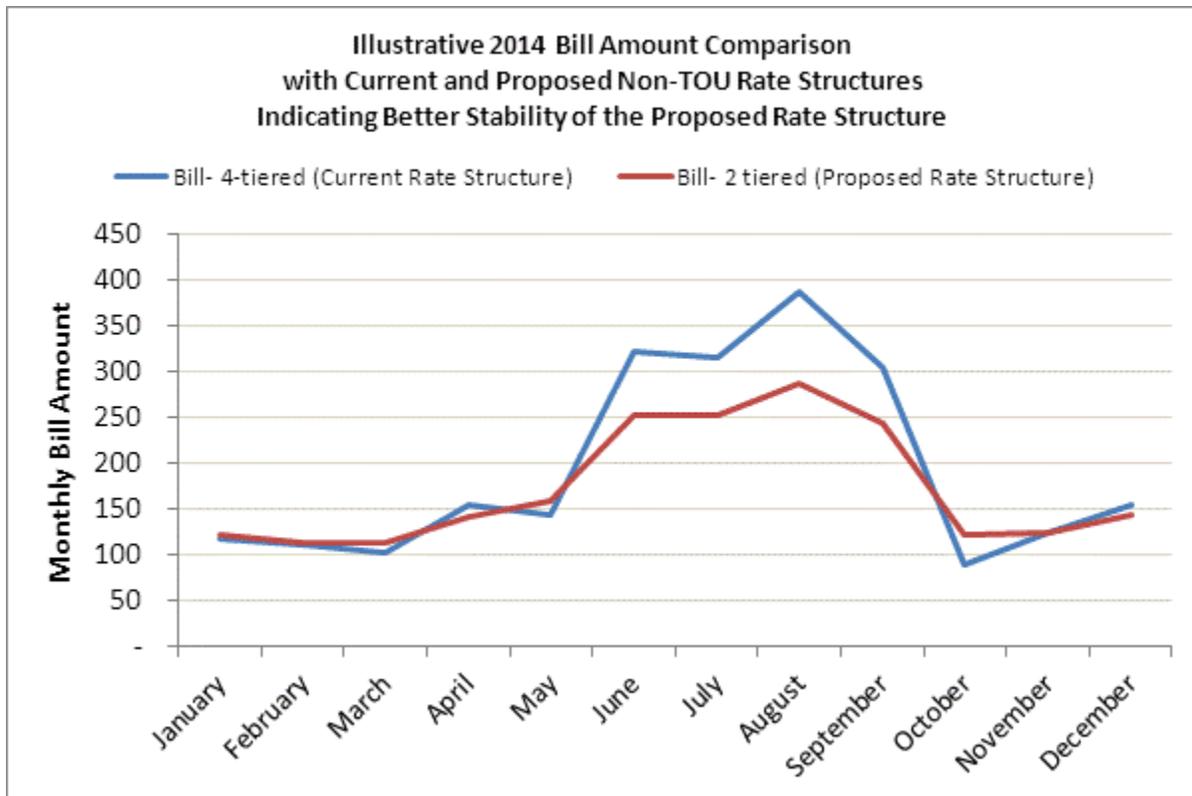
<sup>91</sup> PG&E adjusted the Bill Calculator to be able to use 2014 revenue forecast to generate Figure 4-1 and Figure 4-2.

would occur based on the current rate structure. Specifically, PG&E input a -0.20 price elasticity estimate in its input assumptions for customers switching from current tiered to non-TOU rates, and elasticities of -0.20 (substitution) and -0.04 (daily) for the non-TOU to TOU rate change. The results showed reductions in overall energy usage between approximately 2 percent to 3 percent from customers migrating from today's currently tiered rates to an end state two-tiered standard and non-tiered TOU rate structures over an illustrative four year period. PG&E has not yet determined the most appropriate transition period for its Rate Design Reform Proposal, and thus the transition period for purposes of evaluating energy conservation effects may be shorter or longer than the illustrative period. However, the energy conservation effects of the Rate Design Reform Proposal are positive without regard to the length of the transition period.

#### **4.6. Choice, Simplicity and Stability**

PG&E's proposed standard (non-TOU) rate design has only two tiers, which is much simpler than the current four-tier structure. For optional TOU rates, PG&E's proposed rate design has no usage tiers at all, which is *far* simpler than today's four-tiered TOU rate. In addition, PG&E's Proposal that the CARE discount be provided via a flat discount percentage of non-CARE bills (whether standard or TOU) further simplifies the tariffs. Moreover, PG&E's proposed new two-tier rate structure significantly reduces today's high summer bill volatility, by significantly reducing the magnitude of the highest tier rate.

**FIGURE 4-3  
PACIFIC GAS AND ELECTRIC COMPANY  
ILLUSTRATIVE 2014 BILL AMOUNT COMPARISON WITH CURRENT AND PROPOSED NON-TOU  
RATE STRUCTURES INDICATING BETTER STABILITY OF THE PROPOSED RATE STRUCTURE**



#### **4.7. Transition Analysis Methodology**

PG&E understands that its Rate Design Reform Proposal cannot be implemented immediately, but rather must be implemented over a reasonable transition period to manage bill impacts on some customers while also providing bill relief to others. While the transition period must be sufficient to keep bill impacts manageable, at the same time those customers who are being harmed by the current rate design (and who have, over the last decade, shouldered a disproportionate share of the cost burden allocated to the residential class) should receive timely rate relief.

Key considerations that drive the pace at which customers should be transitioned include: (a) managing customer bill impacts, (b) evaluating tolerance for bill increases as it relates to customers' energy burdens (affordability or bill-to-income ratios),

(c) coordinating the pace of the transition in years with future utility revenue requirements changes, (d) managing the amount of revenue loss that can occur with increased TOU rate plan adoption by customers, and (e) determining the appropriate levels each year of particular rate components like the monthly fixed fee and the CARE discount percentage.

As described above, PG&E's Proposal for standard rates involves moving from the current four-tiered structure to the two-tiered structure that existed before the energy crisis, coupled with a monthly fixed fee to more fairly collect a portion of PG&E's fixed costs of service. Similarly, PG&E's Proposal for voluntary TOU rates involves moving from the complicated four-tiered TOU rates that exist today to a much simpler TOU rate schedule without any tiers and with a monthly fixed fee. Different approaches can be employed in order to get from the current to the proposed new designs. One way to do this is to calculate rates each year under both the current and the new proposed rate designs, and take the weighted average of the two (with the weights gradually changing over time to arrive at the new rate design).<sup>92</sup> However the rates are calculated, the important thing is for the rate changes to occur at a pace that provides long needed rate relief for upper tier customers, while at the same time providing lower tier non-CARE and CARE customers with the means to manage their energy bills relative to their energy burdens.

In this proceeding the Commission need not, and in fact should not, adopt any particular transition schedule. That can be done in future rate proceedings based on

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<sup>92</sup> For example, if it is desired to have the transition occur over a four-year period, in the first year the current rates would be given a weight of 0.75 and the new proposed rates a weight of 0.25. Then in the second year, each set of rates would be given a weight of 0.50. In the third year, the current and new rates would receive weights of 0.25 and 0.75, respectively. Finally, in the fourth year the current and new weights would be zero and one, and the transition would be complete.

then-current information about revenue requirement and sales forecasts. Rather, in this proceeding, the Commission should approve PG&E's Proposal for the optimum features of appropriate, cost-based, rate structures (standard and TOU) toward which rates should change. The details as to the path to the proposed rate design structure, as well as the optimal length of the transition period, can be determined later.

#### **4.8. Customer Affordability**

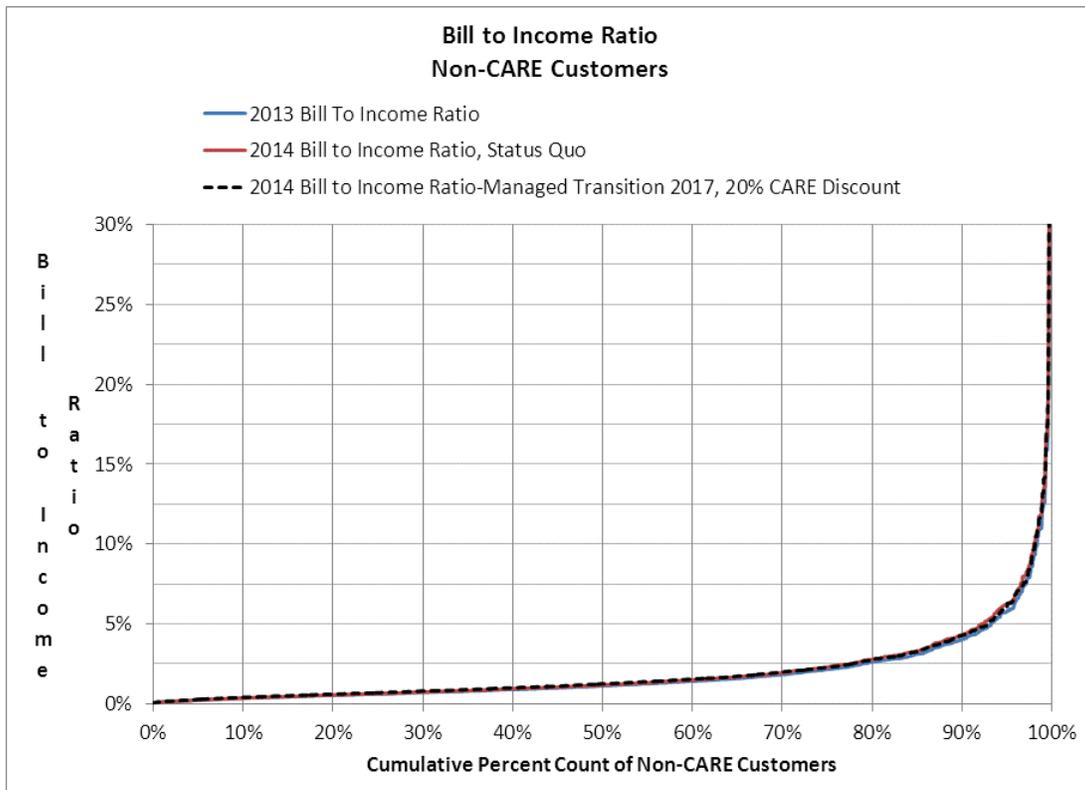
PG&E has analyzed the impact of illustrative rate design proposals on affordability. To do this, PG&E utilized customer-reported income data from the aforementioned 2009 RASS conducted by California Energy Commission combined with bill amounts obtained from the Bill Calculator Model to calculate bill-to-income ratios. Particular focus was paid to the first year of transition, since the analysis suggested that the second year and beyond will have similar or lesser impacts than the first year.

Bill to income ratios were calculated for the following cases:

- Case 1: 2013 bill amounts based on PG&E's May 2013 rates;
- Case 2: 2014 bill amounts based on the 2014 forecasted rates assuming that the rate structures remain the same as of today (i.e., four-tiered rate structure with a minimum bill amount and no customer charge); and
- Case 3: 2014 bill amounts based on the 2014 forecast rates assuming that the proposed new rate structure is in place (including a customer charge replacing the minimum bill amount).

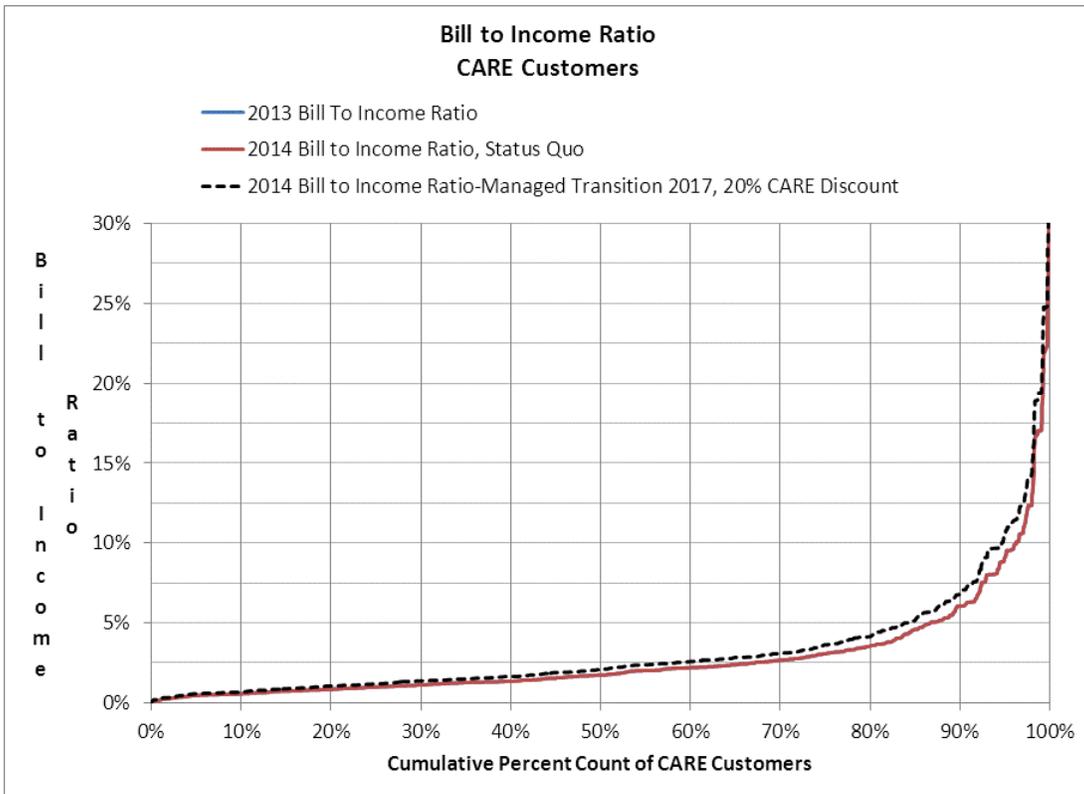
The bill-to-income ratios described above are shown in Figures 4-4 (for non-CARE households) and 4-5 (for CARE households) below.<sup>93</sup> The horizontal axes of these figures show the cumulative percent count of non-CARE and CARE customers respectively (arranged in ascending order of bill-to-income ratio), while the vertical axes show the bill-to-income ratios. Although the figures and length of the transition period are illustrative only, and PG&E’s specific rate proposal may differ, the figures show that the impact of an illustrative four year transition period on the bill-to-income ratios of non-CARE customers is insignificant, while the similar impact on CARE customers’ ratios is slightly larger but still very modest and manageable.

**FIGURE 4-4  
PACIFIC GAS AND ELECTRIC COMPANY  
BILL TO INCOME RATIOS FOR NON-CARE CUSTOMERS**



<sup>93</sup> These charts include the effect of customers choosing between non-TOU and TOU rates based on assumptions regarding what a tolerable bill impact would be.

**FIGURE 4-5  
PACIFIC GAS AND ELECTRIC COMPANY  
BILL TO INCOME RATIOS FOR CARE CUSTOMERS**



#### **4.9. Conclusion**

The Bill Calculator has enabled review of various illustrative rate structures and the relative bill impacts for each structure analyzed. The results suggest that proposed rate structures with fewer or no tiers and with a reasonable monthly fixed fee most appropriately serve the optimum rate design principles, and will result in a significant improvement from the current rate structures. The results of the transition analysis also suggest that the changes proposed to achieve the rate design structure can be accomplished in a reasonable timeframe with manageable changes and impacts on customers.

## **5. CHAPTER FIVE: Benchmarking PG&E's Electric Rate Design Reform Proposal With Other Utilities in California and Outside California**

### **5.1. Scope of Benchmarking**

PG&E has benchmarked electric rate design structures of other utilities and in other states.<sup>94</sup> As discussed in more detail below, PG&E's benchmarking indicates that California's existing residential electric rate design structure is far out of step with the residential rate design structures of other California energy and non-energy utilities and utilities in other states. In fact, electric utilities in other states with progressive energy and environmental policies, including policies supporting energy conservation, renewable energy and direct assistance to low income utility customers, achieve their energy and environmental goals with electric rate design structures very similar to PG&E's Electric Rate Design Reform Proposal.

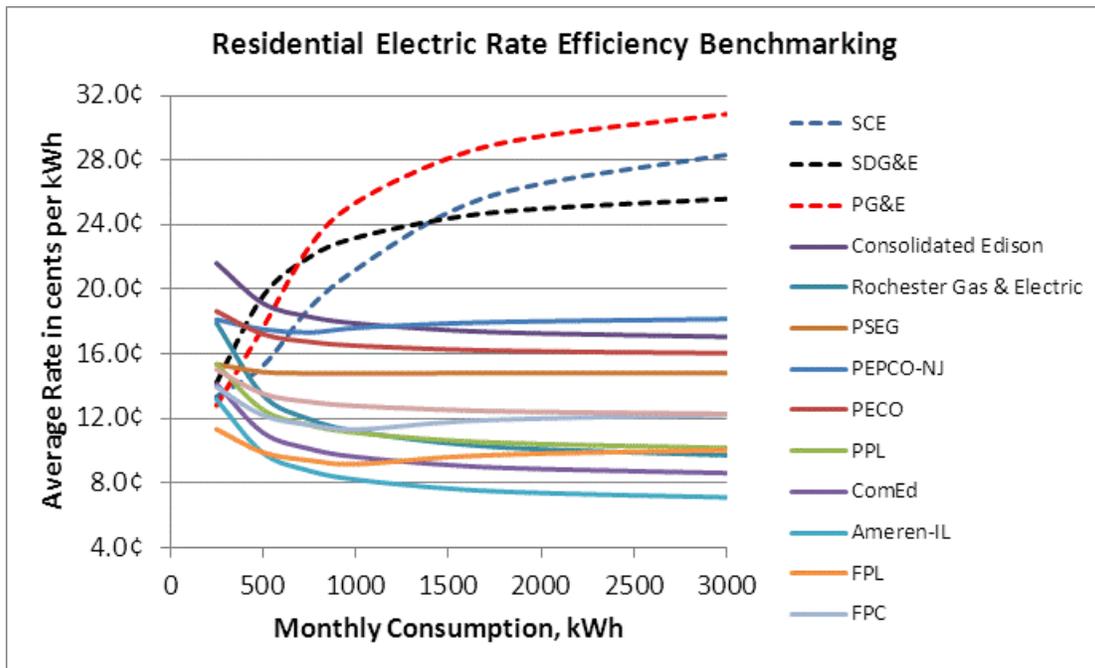
### **5.2. Rate Efficiency**

Appropriate cost basis is a cornerstone of rate design. To benchmark the cost basis of the current rate structure, PG&E has studied the relationship of the average rate to the usage (kWh) of a large number of Utilities. The 2012 rate data shows that the average rate declines as the usage increases for most of the utilities (except California's investor owned utilities). This is shown in the figure below. PG&E's proposed new rate structures (two-tiered non-TOU and flat TOU) along with monthly fixed fee will help in achieving a declining average rate with increasing usage which will then better reflect a more appropriate cost basis behavior similar to that demonstrated by the rate structures of most of the utilities in the nation.

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<sup>94</sup> Rates structures of twenty-two utilities from outside California have been surveyed.

**FIGURE 5-1  
PACIFIC GAS AND ELECTRIC COMPANY  
COMPARISON OF COST BASIS EMBEDDED IN 2012 RATES OF A FEW UTILITIES**



### 5.3. Monthly Fixed Fee

PG&E has reviewed the monthly fixed fees that existed in 2012 across various utilities in the nation. These utilities have monthly fixed fees of varying amounts in their rate structures. Approximately 27 percent of the utilities surveyed have fixed fees above \$10/month, while 64 percent of these utilities have fixed fees between \$5/month and \$10/month. Incorporating a monthly fixed fee in the rate structure helps to improve the cost basis of rates, since a significant portion of the utilities' costs is fixed. For this reason, PG&E's proposed new rate structures will include a suitable monthly fixed fee.

In addition, California publicly-owned utilities such as the Sacramento Municipal Utility District (SMUD), have monthly fixed fees, including in climate zones with above-average usage. For example, SMUD currently charges \$12.00 per month for

non-CARE customers and \$3.50 per month for CARE customers, and plans to ramp up its non-CARE fixed fee to \$20 over time.<sup>95</sup>

It is important to note that a monthly fixed fee, although fixed in nature, does not negatively impact energy conservation. Research shows that customers respond to the total bill (i.e., average rate) rather than the marginal (per kWh) rate. Hence a suitable monthly service fee will not impact energy conservation negatively, and will improve the cost basis and economic efficiency of rates.

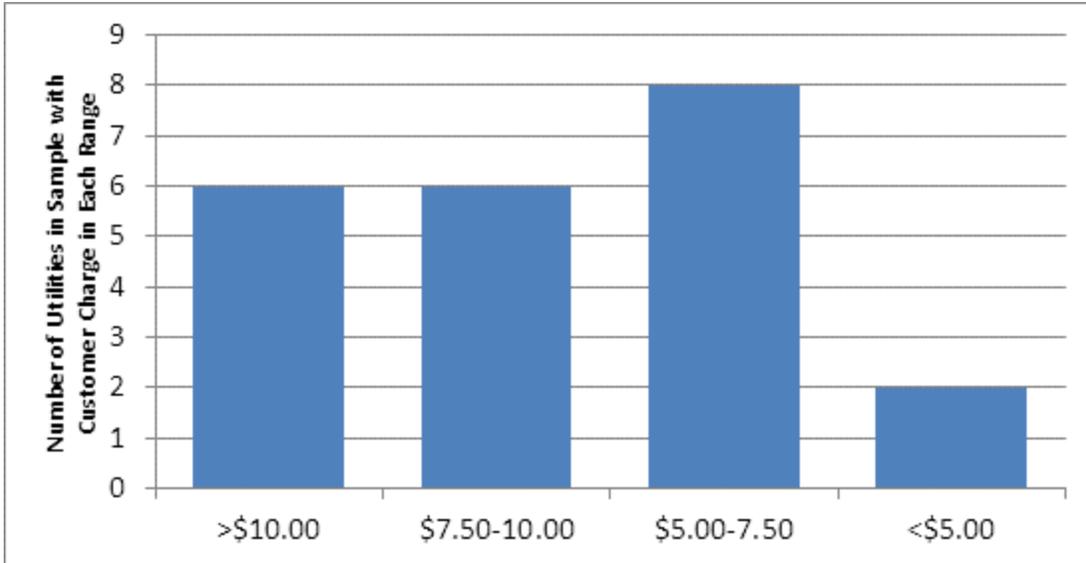
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<sup>95</sup> See discussion in Section 2.1.4, above.

**FIGURE 5-2  
PACIFIC GAS AND ELECTRIC COMPANY  
MONTHLY FIXED FEE DATA FOR REPRESENTATIVE UTILITIES**

Utility	State	Monthly Service Fee
Alabama Power Co	AL	\$ 14.50
Arizona Public Service Co	AZ	\$ 8.55
Baltimore Gas & Electric Co	MD	\$ 7.50
Commonwealth Edison Co	IL	\$ 15.06
Connecticut Light & Power Co	CT	\$ 16.00
Consolidated Edison Co-NY Inc	NY	\$ 15.76
Consumers Energy Co	MI	\$ 7.00
Detroit Edison Co	MI	\$ 6.00
Duke Energy Carolinas, LLC	NC	\$ 9.90
Florida Power & Light Co	FL	\$ 7.24
Georgia Power Co	GA	\$ 9.00
Massachusetts Electric Co	MA	\$ 4.00
Niagara Mohawk Power Corp.	NY	\$ 17.00
Northern States Power Co	MN	\$ 7.11
PECO Energy Co	PA	\$ 7.09
PPL Electric Utilities Corp	PA	\$ 14.17
Progress Energy Carolinas Inc	NC	\$ 7.17
Progress Energy Florida Inc	FL	\$ 8.76
Public Service Co of Colorado	CO	\$ 6.75
Public Service Elec & Gas Co	NJ	\$ 2.43
Union Electric Co	MO	\$ 8.03
Virginia Electric & Power Co	VA	\$ 7.00
Pacific Gas & Electric Co	CA	\$ -
San Diego Gas & Electric Co	CA	\$ -
Southern California Edison Co	CA	\$ 0.87

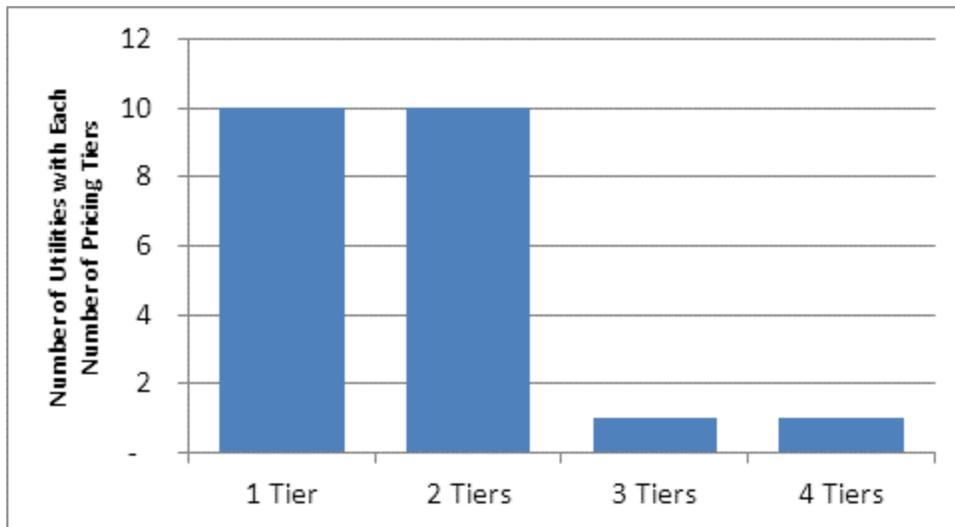
**FIGURE 5-3  
PACIFIC GAS AND ELECTRIC COMPANY  
MONTHLY FIXED FEE DISTRIBUTIONS FOR REPRESENTATIVE UTILITIES**



#### **5.4. Number of Rate Tiers**

PG&E has reviewed the number of rate tiers that existed in 2012 across various utilities in the nation. Twenty out of the twenty-two utilities surveyed have two tiers or fewer in their residential rate structures. Based on this benchmarking data as well as PG&E’s analysis of various rate design structures, PG&E has proposed a two-tiered non-TOU rate structure and a flat TOU rate structure that will serve the CPUC’s rate design principles significantly better than the current rate structures.

**FIGURE 5-4  
PACIFIC GAS AND ELECTRIC COMPANY  
NUMBER OF RATE TIERS FOR REPRESENTATIVE UTILITIES**



### **5.5. Conclusion**

PG&E's benchmarking of other investor-owned and publicly owned electric utilities demonstrates that PG&E's Rate Design Reform Proposal is in line with the vast majority of its peer utilities around the country.

## **6. CHAPTER SIX: Policy Recommendations and Next Steps**

### **6.1. The Current Residential Electric Rate Structure Fails to Meet the Commission’s Rate Design Principles and Is Unfair and Inequitable to Millions of PG&E’s Customers**

As demonstrated above, California’s current investor-owned utility residential electric rate design structure is neither cost-based nor equitable, and therefore fails to meet the Commission’s rate design principles. Millions of PG&E’s residential electric customers across all income levels and all parts of PG&E’s service territory are paying millions of dollars a year in higher electric bills because of the broken rate design structure. The broken rate structure cannot be fixed by small incremental steps or without changes in law. Nor can it be fixed overnight. But it must be fixed soon, or else the unfair shifting of costs among customers will only get worse and potentially derail California’s ambitious energy and environmental agenda. The Legislature should expeditiously adopt AB 327 (Perea) to give the Commission the tools to fix and reform today’s broken rate structure, and the Commission should support AB 327.

### **6.2. PG&E’s Proposal to Reform the Residential Electric Rate Design Structure Will Meet All the Commission’s Rate Design Principles and Remove the Unfairness and Inequity in the Current Rate Structure**

PG&E’s Rate Design Reform Proposal will meet the Commission’s fundamental goals of returning residential electric rates closer to cost while maintaining and improving the affordability of electricity for those who most need it. Over a reasonable transition period, PG&E’s proposal will provide residential customers with simple and understandable rate options for their electricity needs, including a time-of-use rate option that allows them to save energy and money on their monthly bills by shifting their energy use to off-peak periods. The decade-old “temporary” tiered-rate structure will be

returned toward its historical cost basis, including a differential between baseline rates and other rates that is reasonable, closer to cost, and manages significant bill volatility. Finally, PG&E's proposal opens up residential electricity markets to much broader opportunities for third-party entrepreneurs to provide all residential customers with "beyond the meter" energy solutions that align with the transparent and accurate price signals communicated by the reformed residential rate structure.

### **6.3. PG&E Will Provide a Reasonable Transition to Protect Customers and Ensure that Customers Are Fully Aware and Educated on the New Rate Structure**

PG&E's rate vision is built on a foundation of both customer choice and customer understanding of their choices. An optimal rate design would return PG&E's residential electric rates toward cost and an efficient level of rate assistance to needy customers as soon as possible. However, PG&E's proposal recognizes the essential role that customer education and understanding must play in a successful transition to the new rate structure. Therefore, PG&E's proposal includes a multi-year transition period with an expectation that comprehensive, extensive outreach and education of residential electricity customers is needed before the rate design changes are fully implemented.

### **6.4. PG&E's Rate Design Reform Proposal Will Protect Low Income Customers and Increase the Tools and Assistance Available to Those Customers to Help Them Pay Their Utility Bills**

PG&E's Rate Design Reform Proposal maintains fair and substantial rate assistance to low income customers under the CARE program. It does so in recognition that not only is the current CARE discount too high and unfocused relative to historical levels, but also that the CARE program itself will need to undergo reform and improvements during the same period that PG&E's Rate Design Reform Proposal is

being implemented. Like the tiered residential rates themselves, the size of the CARE discount and subsidy is unsustainable. But PG&E's proposal does not just rely on a mechanical reduction in the CARE discount itself. Instead, PG&E would improve the tools and assistance available to low income customers to manage and reduce their energy burdens and help pay their monthly energy bills. As a result, PG&E intends that, as the CARE program itself becomes more efficient and targeted, the reduction in the CARE discount will be modest in effect and manageable for customers.

#### **6.5. PG&E's Rate Design Reform Proposal Will Provide More Effective Incentives for Energy Conservation and Greater Reductions in Greenhouse Gas Emissions Than the Current Rate Structure**

A primary goal of PG&E's Rate Design Reform Proposal is to ensure that residential electric rates accurately incorporate the price of carbon to all customers at all time periods of the day over a reasonable transition period. In so doing, PG&E's proposal will provide millions of customers with a more appropriate incentive to conserve and manage their energy use as part of their monthly energy bills, thus expanding the opportunity for those customers to directly reduce their "carbon footprints" and address climate change. For the first time in over a decade, most residential electric customers will see the real price of energy, including fully internalizing the costs of carbon and other environmental externalities consistent with California's progressive energy and environmental policies.

**6.6. The Commission Should Adopt PG&E’s Electric Rate Design Reform Proposal as the Preferred Rate Design for Residential Electric Rates, and Authorize PG&E to File a Formal Rate Design Application to Implement a New Residential Electric Rate Structure Consistent With the Proposal**

As discussed above, PG&E’s Rate Design Reform Proposal is fully supported by the facts and demographics of PG&E’s customers and costs of service, and is consistent with the Commission’s principles for optimal rate design. The Commission should adopt PG&E’s Rate Design Reform Proposal as the preferred rate design policy for PG&E’s residential electricity customers. The Commission should also authorize PG&E to file a formal rate design application to implement a new residential electric rate design structure consistent with PG&E’s proposal. The California Legislature should enact AB 327 (Perea) to provide the Commission, PG&E, and PG&E’s electricity customers the tools to put PG&E’s Proposal into effect and provide PG&E’s customers with the bill relief they need.

***PACIFIC GAS AND ELECTRIC COMPANY***  
***APPENDIX A***  
***CUSTOMER RESEARCH SURVEY AND REPORT***

***PACIFIC GAS AND ELECTRIC COMPANY***  
***APPENDIX A.1.***  
***CUSTOMER RESEARCH KEY FINDINGS REPORT***

# RROIR Customer Survey Key Findings

April 16, 2013  
Final Draft

Prepared for:



# Research Objectives

- Joint IOU (PG&E, SCE, SDG&E) survey to obtain customer input into alternative electric rate plans as part of the Residential Rates OIR
- Establish a quantitative understanding of customer preferences for new rate plan options
  - Structures: TOU, tiered, flat
  - New charges: Fixed and demand charges
  - Price variations: Different tier and period price per kWh
- Determine importance / relevance of
  - Rate plan characteristics such as understandable, stable, choice
  - Customer energy use experience, bill review behavior and attitudes toward energy conservation and peak shifting
  - Tolerance for bill change / appetite for bill savings
  - Customer education



# Methodology

HINER & Partners conducted an online survey during March / April of 2013 with ~5,300 electricity customers:

- SCE, SDG&E and PG&E sample (4,283):
  - **“Core”** - representative of IOU populations (2,132)
  - **“Unexposed”** subgroup (606) - similar to Core, but not provided educational information about rate structures during survey
  - Supplemental SCE, SDG&E and PG&E **“Subgroups”** (1,545):
    - **Additional Spanish-speaking** customers (232)
    - **Solar** customers (665)
    - Customers with **High Engagement** in utility programs (480)
    - **Alternatively Recruited Low-income** customers (168)
- Other Jurisdiction **“Subgroups”** (1,021):
  - California: **Riverside, LADWP, SMUD** (621)
  - Outside California (400):
    - **Arizona Public Service (APS) / Salt River Project (SRP)** (200)– high opt-in to TOU rates
    - **Hydro One** – All customers defaulted to TOU (200)



# Methodology

- Sample quotas were used for the Core and Unexposed groups to match population age and income from census data
  - Core and Unexposed data was weighted to match: (1) population education, and (2) utility household decision-maker gender (60% female/40% male)
  - Other subgroups were not weighted
- Sample provided by
  - Research Now: Core sample plus Unexposed and Other Jurisdiction subgroups
  - uSamp: Additional Spanish-speakers
  - IOUs: High Engagement and Solar
  - Knowledge Networks: Alternatively recruited low-income
- Survey pilot conducted with ~100 Core sample respondents
  - Lowered average survey complete time from ~40 minutes to 28 minutes (Spanish-speakers less than 30 minutes)
  - Lowered “quit” rate from 75% to 30%
  - 46% enjoyed completing the survey / 44% Neutral / 10% did not
- Completed interviews were reviewed for inconsistencies and 3% were removed
- No noticeable difference in results between online and alternative recruitment of low-income customers



*Customer Satisfaction and Knowledge About Rates*

*Interest in Taking Action to Reduce Energy Bills*

*Customer Education*

*Important Factors When Choosing a Rate Plan*

*Rate Preferences (Conjoint Analysis Results)*

*Interest in Switching*

*Willingness to Risk Bill Impacts*

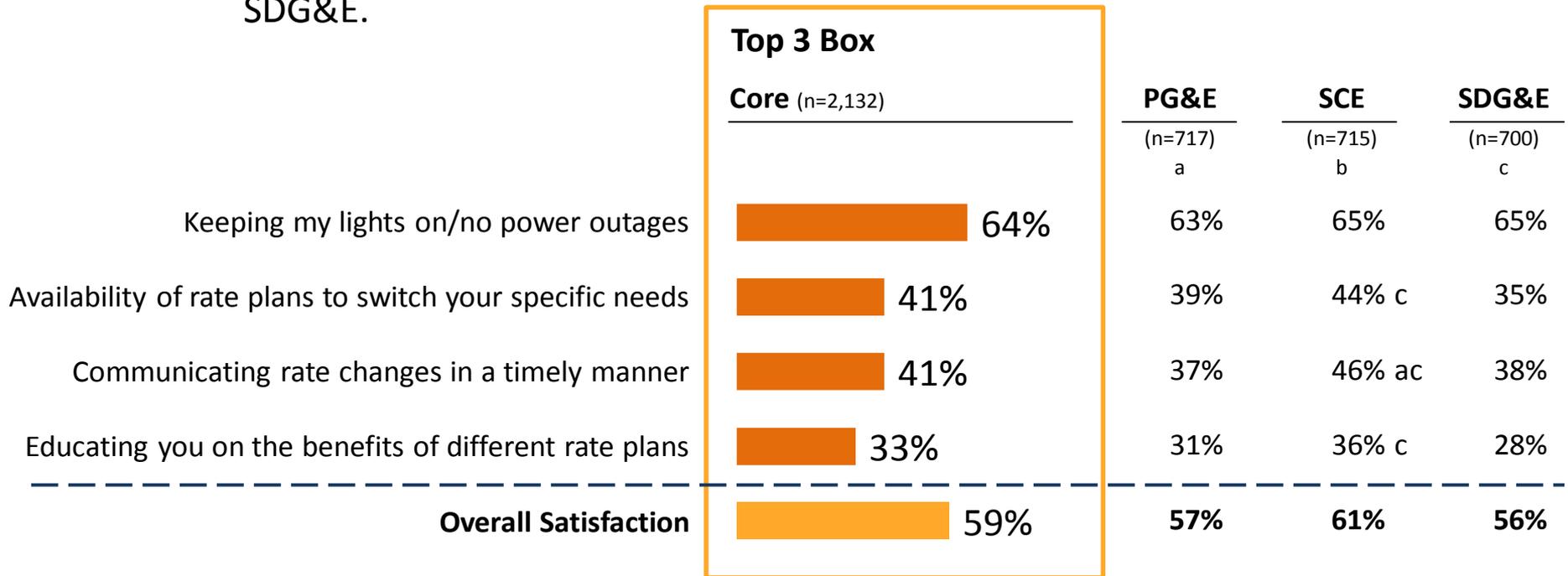
*Effect of Bill Protection (Try Before You Buy)*

## Results



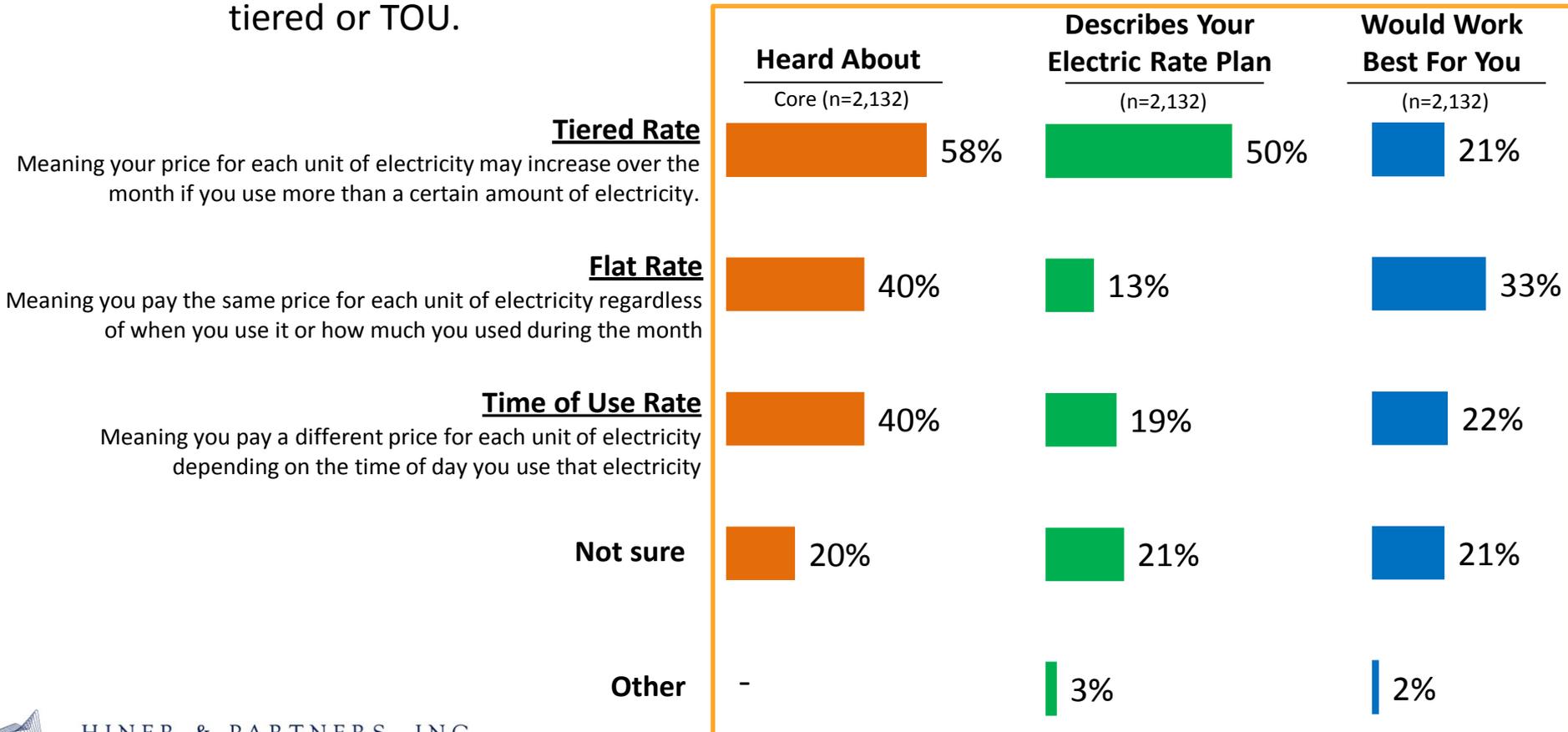
# Customer Satisfaction with Rates

- California IOU customers give their utility company high marks for “keeping the lights on” but they are less satisfied concerning rate options and education.
  - SCE received higher satisfaction scores across all these measures than PG&E or SDG&E.



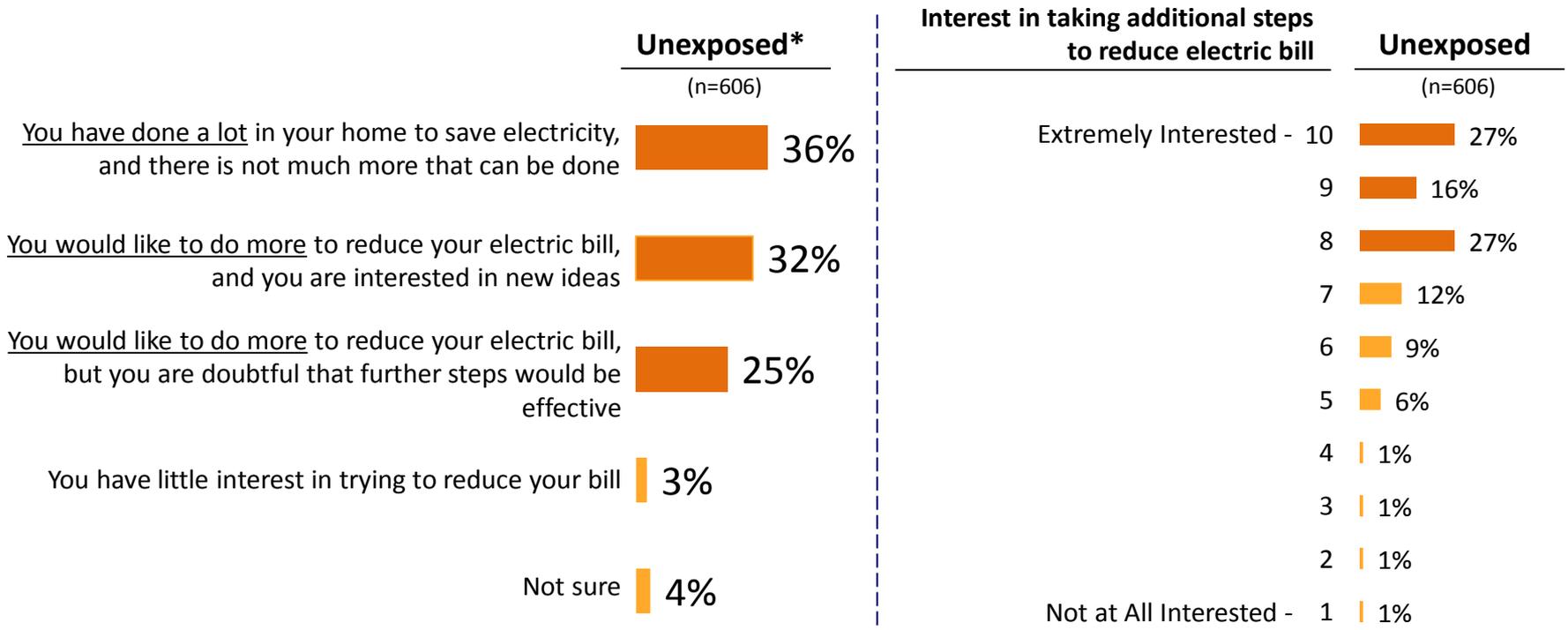
# Customer Knowledge About Rates

- Customer awareness of existing rates is modest at best, especially about the tiered rates most currently have.
  - Initial beliefs (prior to exposure to rate education) about which rate would work best are diffuse, though more customers lean toward a flat rate than tiered or TOU.



# Interest in Taking Action to Reduce

- Before being provided rate education, nearly all customers had some degree of interest in taking action to lower their electric bill, and a majority have a strong interest.
  - This could suggest that most customers would seek a rate that could help them reduce their electric bill, even if the rate requires them to take action.



\*Asked only of Unexposed subgroup, Core presumed to be the same.



# Savings Needed to Prompt Switching

- On an annualized basis, the amount of savings customers say they would need to prompt them to switch to another rate ranges widely
  - 70% of the Core sample say they would need more than \$100 (65% of CARE vs. 72% Non-CARE respondents)
  - The median is \$120/year or \$10/month. Compared to the median self-reported summer energy bill of \$90, this represents about 11%.

	<b>Core</b> (n=2,132)	<b>CARE</b> (n=351) a	<b>Non-CARE</b> (n=1781) b
\$0 to \$99	30%	35% e	28%
\$100 to \$149	22%	23%	21%
\$150 to \$199	3%	3%	3%
\$200 to \$299	16%	19%	15%
\$300 to \$399	8%	9%	8%
\$400 to \$499	2%	1%	3% a
\$500 or more	20%	10%	23% a
<b>Mean</b>	<b>\$237</b>	<b>\$178</b>	<b>\$255 a</b>
<b>Median</b>	<b>\$120</b>	<b>\$100</b>	<b>\$150</b>



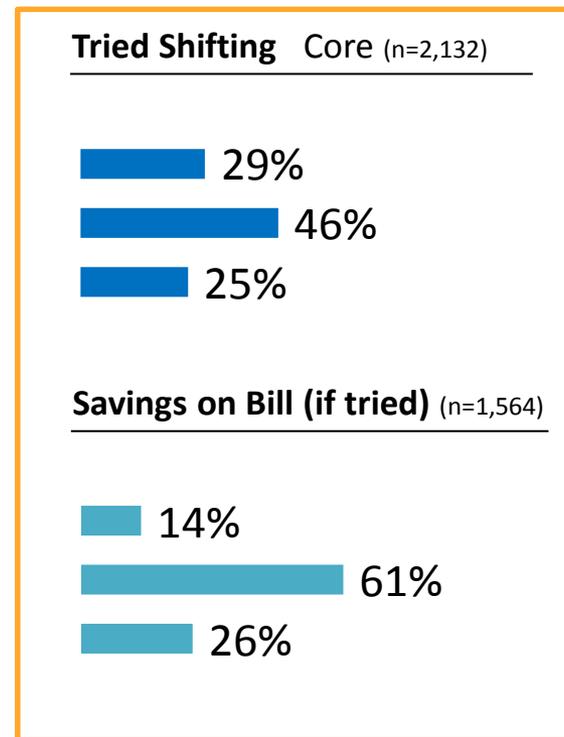
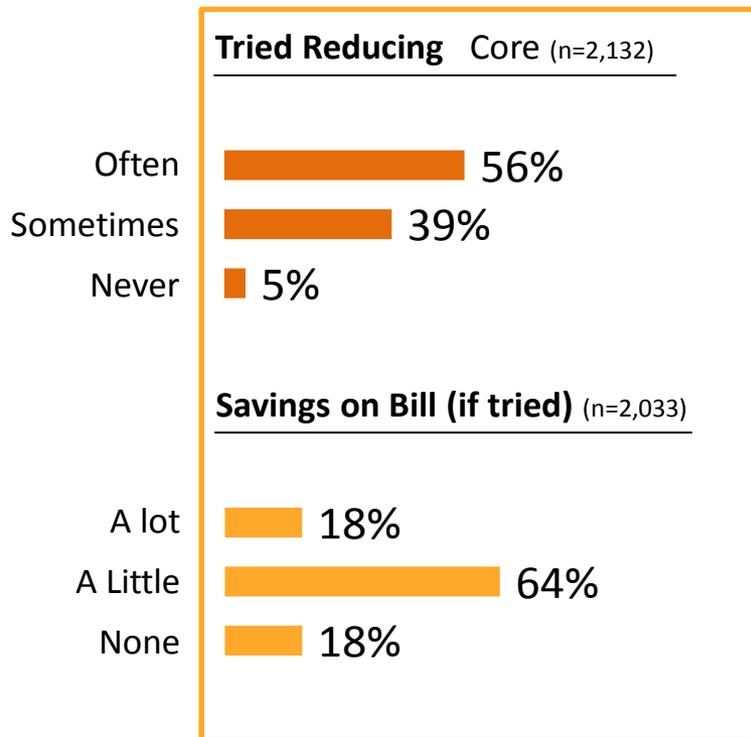
# Rate Plan Option Education

- In the survey, all but the Unexposed respondents were provided information about different rate structures and components
  - Electricity Usage
  - Rate Structures
    - Flat rate plans
    - Tiered rate plans
    - Time-of-Use rate plans
  - Rate Structure Components
    - Price per kilowatt-hour (kWh)
    - Monthly service fees
    - Demand charges
  
- Additionally, respondents answered questions about previous and future actions that could be taken in their homes to reduce and shift electricity use.
  
- The Unexposed group went immediately into rating importance of specific factors when choosing rates, and then the conjoint decision tasks.



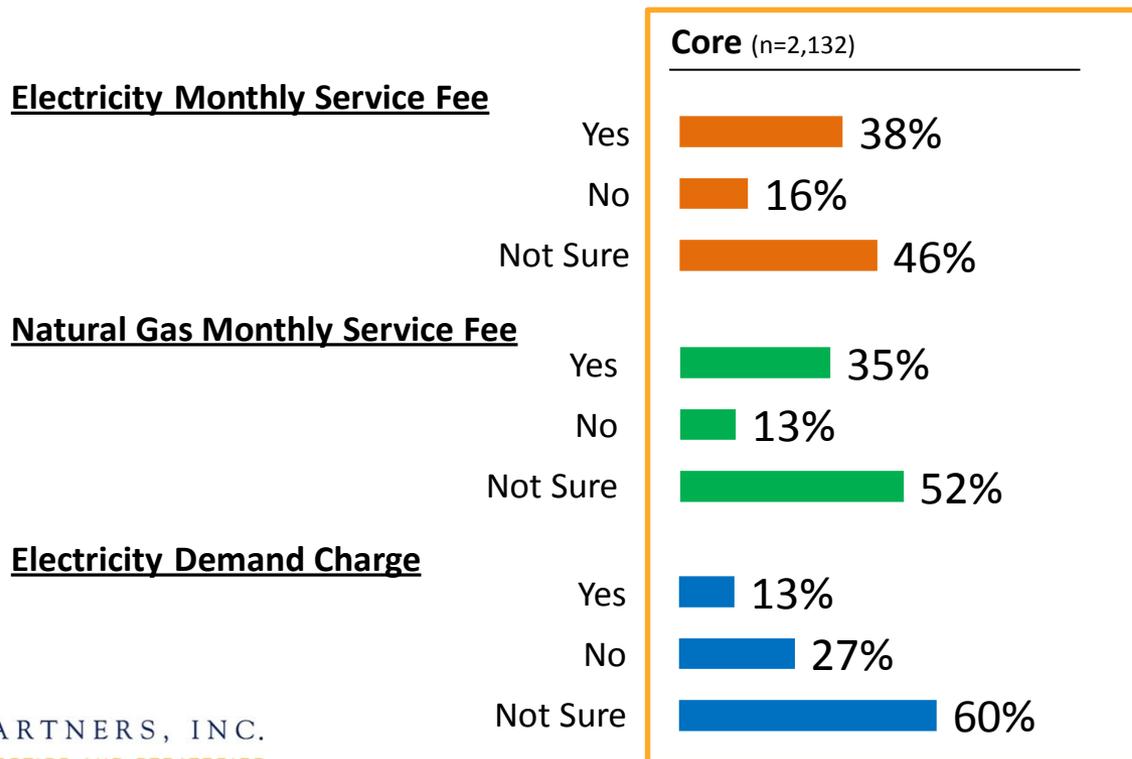
# Education: Energy Use Behavior

- 95% have tried to save money on their bill by reducing their energy use
- 75% have tried to save money by shifting their electricity use
  - Despite most customers knowing they are not on a TOU rate, many believe they have saved money by shifting.



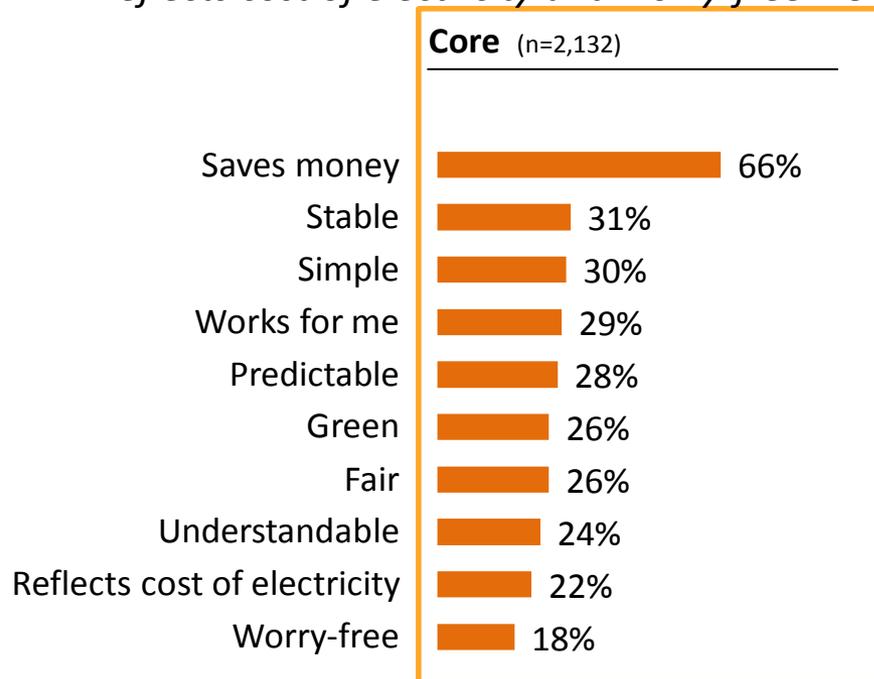
# Education: Monthly Service Fee & Demand Charges

- Customers were asked if they currently have a monthly service fee or demand charge.
  - About one in three believed that they currently have a monthly service fee for electricity and natural gas, while fewer (13%) believed they have a demand charge.
  - Still, the top answer for current service and demand charges was “not sure.”



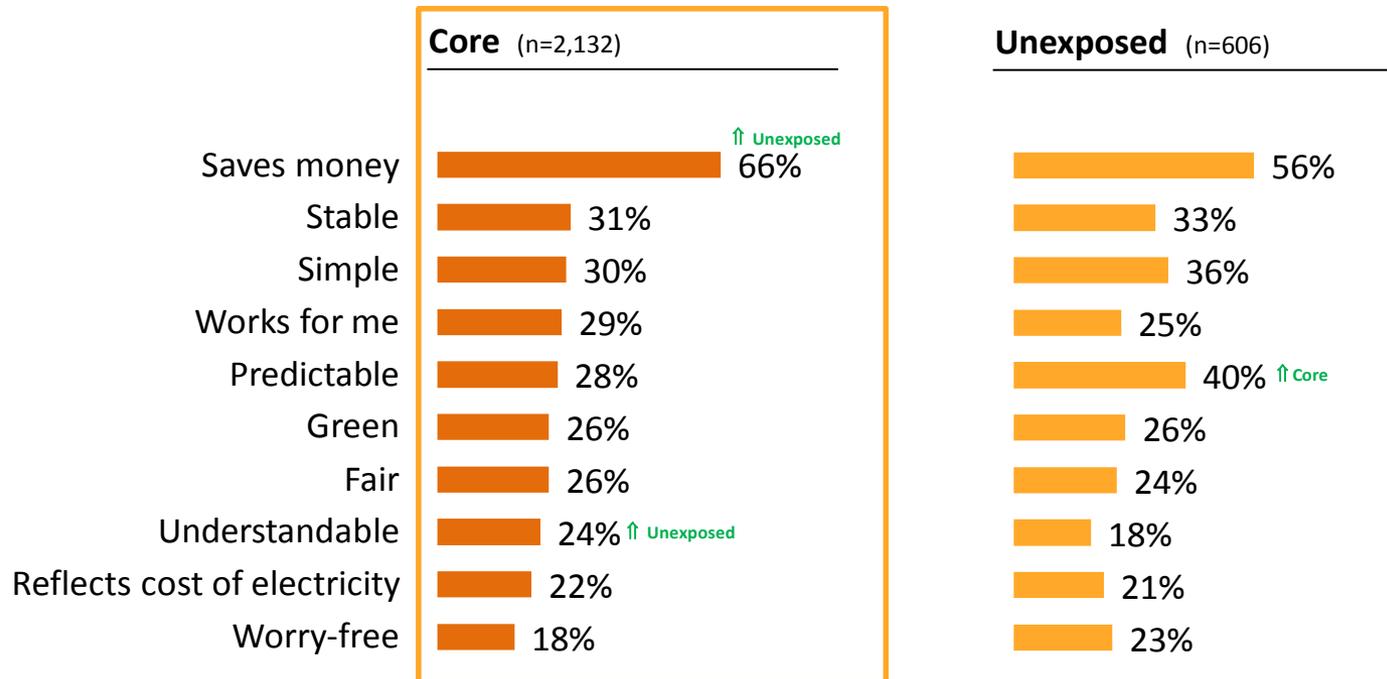
# Important Factors When Choosing Rates

- Unsurprisingly, *saving money* is the number one driver of rate choice which is consistent with customers' willingness to take action to save money on their bill.
  - To a lesser extent, customers want *stable, simple, works for me, and predictable*.
  - Many factors were fairly equal in importance
  - *Reflects cost of electricity and worry-free* were the least important



# Important Factors When Choosing Rates

- “Unexposed” customers had slightly different preferences
  - Valued *predictable* more than the Core sample, and *saving money* and *understandable* a bit less.
  - Could imply that education increases appreciation for understanding rates and boosts expectation for taking action to saving money.



# Rate Preferences: Choice Exercise

## Choice Set Example.

- Respondents given thirteen choice sets each with three different rate plan options (~82,000 choices made by Core sample)

**Q 14 - Please carefully look at all three rate plans and pick the rate plan that you prefer the most.**

### Rate Type Flat Rate

Price.....\$0.24

Monthly Service Fee \$10.00

Demand Charge \$5.00

### Time of Use - 3 Periods

Off Peak Price .....\$0.09  
Part Peak Price.....\$0.22  
On Peak Price .....\$0.46

\$0.00

\$2.00

### 3 Tiered

T1 Price.....\$0.20  
T2 Price.....\$0.24  
T3 Price.....\$0.29

\$0.00

None



# Rate Plan Attributes and Levels

Attributes	Levels				
Type	2 TIER	3 TIER	TOU 3	TOU 2	Flat
Monthly Service Fee	\$0.00	\$5.00	\$10.00	\$15.00	
Demand Charge	\$0.00	\$2.00	\$5.00		
Price per kWh	All Low	Wide Spread	Narrow Spread	All High	

Detail: Price per kWh	All Low	Wide Spread	Narrow Spread	All High
<b>2 TIER</b>	\$0.12	\$0.16	\$0.15	\$0.18
	\$0.14	\$0.20	\$0.17	\$0.19
<b>3 TIER</b>	\$0.10	\$0.11	\$0.18	\$0.20
	\$0.12	\$0.20	\$0.22	\$0.24
	\$0.16	\$0.29	\$0.26	\$0.29
<b>TOU 3</b>	\$0.12	\$0.09	\$0.16	\$0.18
	\$0.13	\$0.22	\$0.20	\$0.24
	\$0.16	\$0.46	\$0.24	\$0.26
<b>TOU2</b>	\$0.12	\$0.08	\$0.18	\$0.22
	\$0.14	\$0.30	\$0.20	\$0.26
<b>Flat Rate</b>	\$0.12	\$0.16	\$0.20	\$0.24



# Rate Plan Preferences: Conjoint Analysis

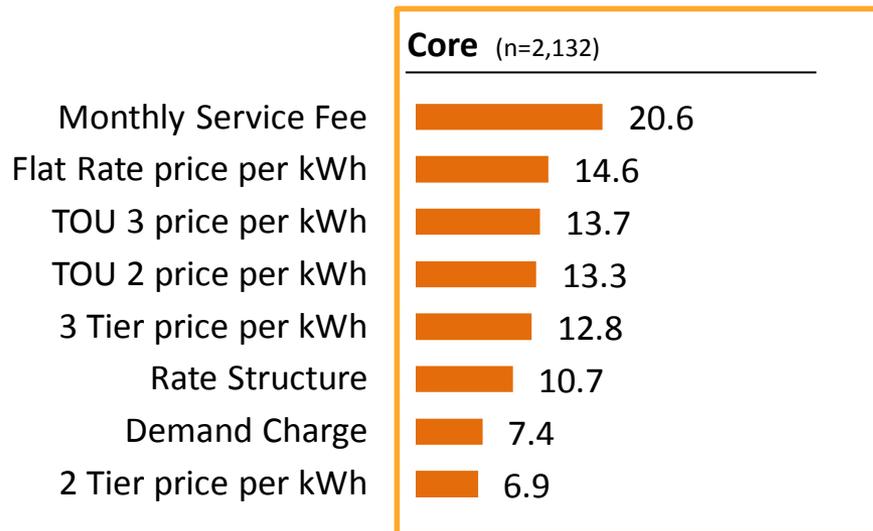
Using Conjoint Analysis, the Choice Set responses were analyzed resulting in:

- **Ratings of Attribute importance (e.g., Monthly Service Fee)**
  - Ratings represent the influence on respondent choice that an Attribute has relative to other Attributes and sum to 100%
  - Ratings can be compared directly, for example, an Attribute with an importance rating of 20% has twice the positive or negative impact on choices as an Attribute with a rating of 10%
- **Scoring of preference for each Level within an Attribute (e.g., \$0, \$5, \$10 Monthly Service Fee)**
  - Utility values (or “part-worths”) represent overall preference for each Level within an Attribute relative to other Levels and are distributed on a scale centered on 0
  - Utility values that are further apart indicate stronger difference in preference between Levels
  - Utility values clustered near 0 indicate weaker difference in preference between Levels
- **Full Choice Preference Simulator**
  - Enables comparison of fully specified rate options to determine customer share of preference for each rate option
  - Rate options are specified using the pre-defined Attributes and Levels allowing analysis of change in customer preference due to changes in a particular Attribute and/or Level



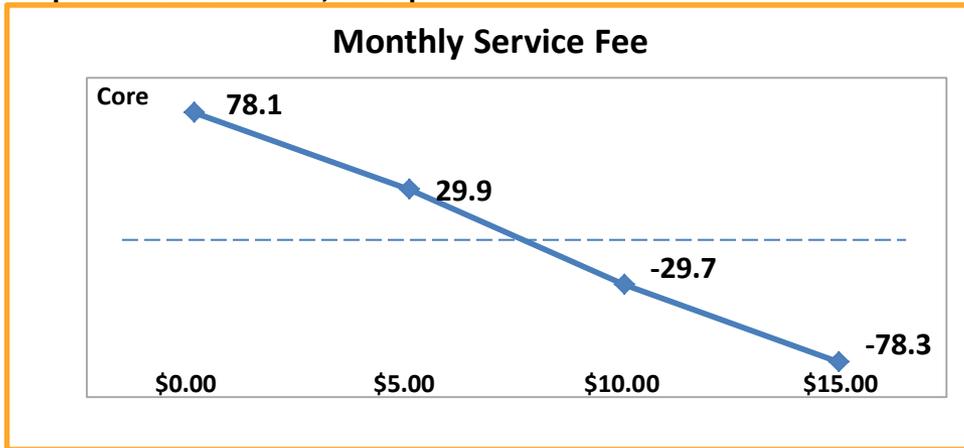
# Rate Preferences: Attribute Importance

- Attribute importance ratings show the “monthly service fee” had more influence on rate choices than any other attribute – whether or not there was a monthly service fee had the most impact on respondent rate plan choice.
- Following the monthly service fee, customers’ choices were influenced heavily by the price per kWh associated with the different rate structures rather than by the rate structure itself.

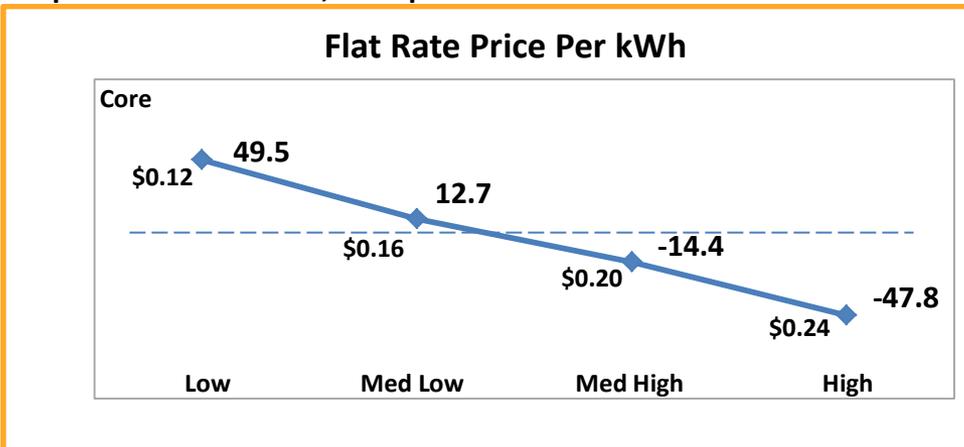


# Rate Preferences: Utility Values

Importance: Core: 20.6, Unexposed 19.8



Importance: Core: 14.6, Unexposed 13.8



## Monthly Service Fee

- Most important attribute in all rate plan selection
- Utility values are linear
  - Indicates negative impact on preference, but similar whether going from \$0.00 TO \$5.00, or from \$5.00 to \$10.00.

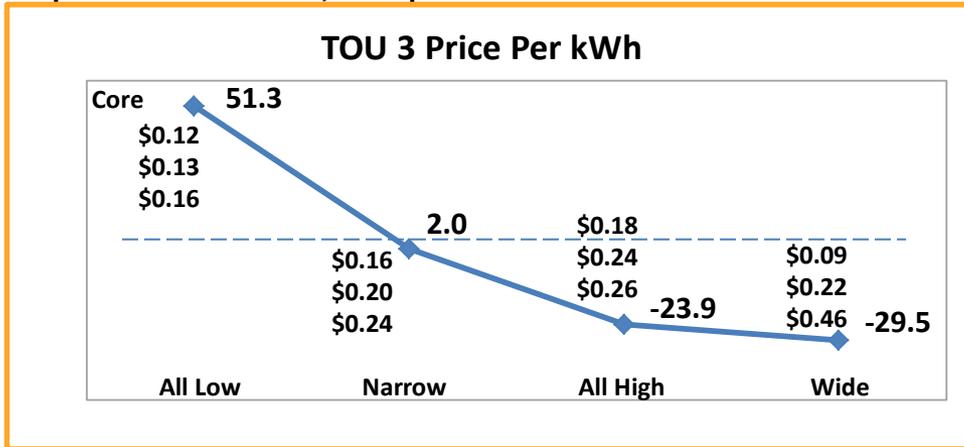
## Flat Rate Price Per kWh

- Very important attribute in Flat Rate rate plan selection
- Gaps between \$0.12 and \$0.16, and \$0.20 and \$0.24, are larger than the gap between \$0.16 and \$0.20
  - Indicates relative indifference to rate changes in the midrange (\$0.16 to \$0.20) compared to rate changes at higher and lower prices per kWh



# Rate Preferences: Utility Values

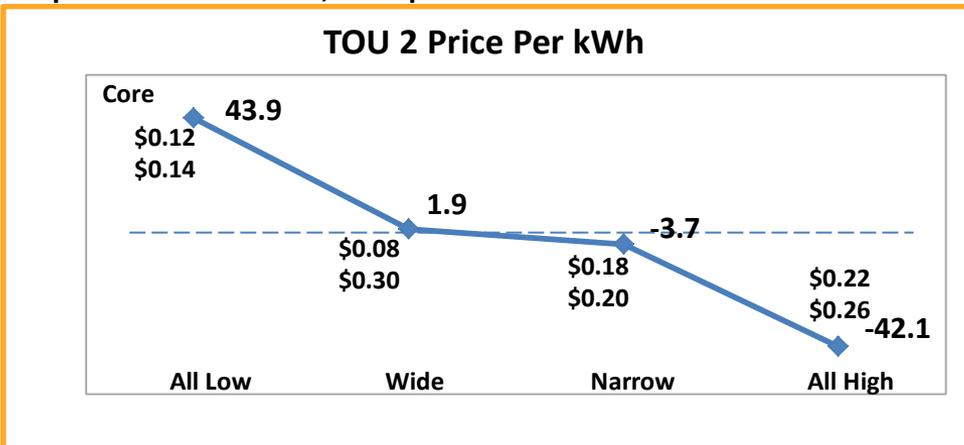
Importance: Core: 13.7, Unexposed 14.6



## TOU 3 Price Per kWh

- Very important attribute in TOU 3 rate plan selection
  - Relatively strong preference for “all low” price per kWh level declining for other price per kWh levels
- Lowest preference for “wide range” which brings both highest potential bill savings and increase
  - Indicates high level of risk aversion for TOU 3 rate plan option.

Importance: Core: 13.3, Unexposed 14.1



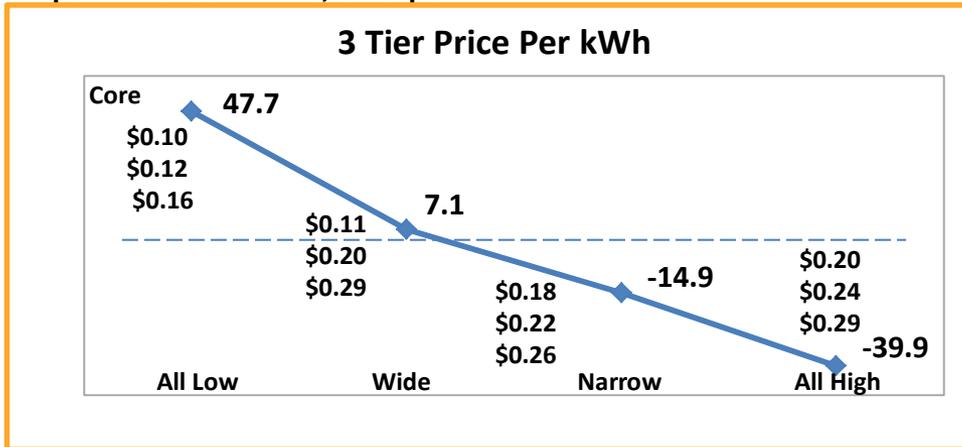
## TOU 2 Price Per kWh

- Very important attribute in TOU 2 rate plan selection
- Nearly equal values for both wide and narrow price per kWh levels
  - Indicates that customers largely indifferent between the two
- Wide price per kWh level for TOU 2 may be preferred over narrow for TOU 3
  - Indicates that a simpler step TOU rate could better overcome risk aversion



# Rate Preferences: Utility Values

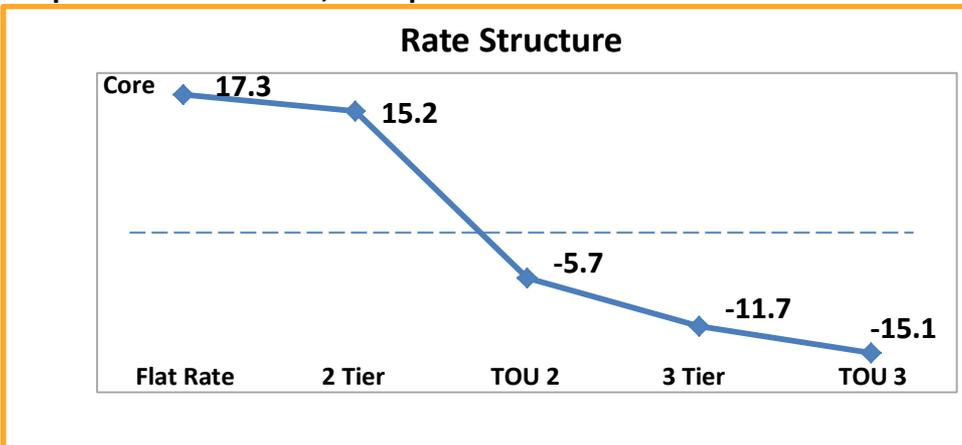
Importance: Core: 12.8, Unexposed 13.4



## 3 Tier Price Per kWh

- Very important attribute in 3 Tier rate plan selection
- Higher utility given to wide price per kWh level than to narrow (similar to TOU 2) but with a larger gap
  - Indicates greater preference for steeper rather than narrow tier price per kWh differentials in a 3 Tier rate

Importance: Core: 10.7, Unexposed 10.9



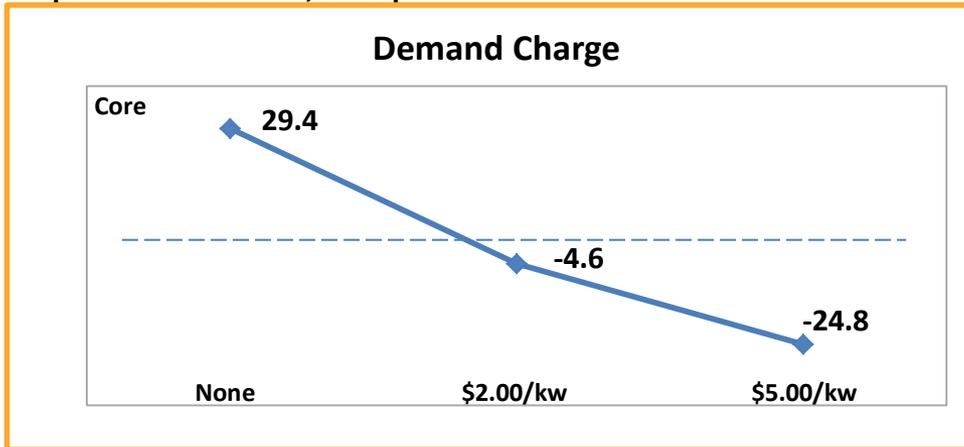
## Rate Structure

- Important attribute rate plan selection, but not as important as price per kWh structure
- Highest and nearly equal utility values given to Flat and 2 Tier rate structures with much lower utility given to TOU 2, 3 Tier, TOU 3.
  - Indicates preference for Flat and 2 Tier rate plans.
  - Indicates preference of TOU 2 rate to 3 Tier rate

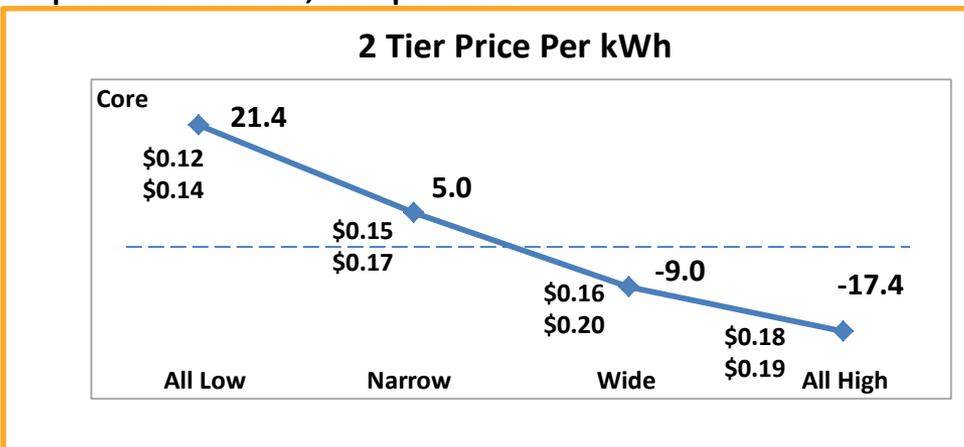


# Rate Preferences: Utility Values

Importance: Core: 7.4, Unexposed 6.4



Importance: Core: 6.9, Unexposed 7.1



## Demand Charges

- Less important attribute in rate plan selection
- Possible that concept was confusing and respondents did not understand that it varies based on kW demand levels, which made demand charges appear low relative to monthly service fee.

## 2 Tier Price Per kWh

- Less important attribute in 2 Tier rate plan selection
  - Indicates kWh price differential between tiers less of an influence than the 2 Tier rate itself
- Difference in price per kWh between the low and high levels relatively narrow compared to the 3 Tier and TOU rates
  - Indicates potentially strong preference for a 2 Tier rate with relatively high tier prices



# Rate Preferences: Simulation Example

- The example below demonstrates the effect of varying rate attributes on customer “Preference Share.”
  - 3 Tiers with no added fees was preferred by 60% over other options with added fees
  - Flat option is most preferred, followed by TOU 3, when added fees are dropped

## Hold Out\* Task (all respondents reviewed)

Rate Structure	Price Per kWh	Monthly Service Fee	Demand Charge	Preference Share
Flat	\$0.24	\$10.00	\$5.00	12%
TOU 3	\$0.09, \$0.22, \$0.46	\$0.00	\$2.00	29%
3 TIER	\$0.20, \$0.24, \$0.29	\$0.00	\$0.00	60%

## Simulator: Hold Out Task With No Monthly Service Fee or Demand Charge

Rate Structure	Price Per kWh	Monthly Service Fee	Demand Charge	Preference Share
Flat	\$0.24	\$0.00	\$0.00	43%
TOU 3	\$0.09, \$0.22, \$0.46	\$0.00	\$0.00	36%
3 TIER	\$0.20, \$0.24, \$0.29	\$0.00	\$0.00	21%



# Simulations: Effect of Monthly Service Fee

- Uneven monthly service fees affect customer preference share.

## Simulation C2

Rate Structure	Price Per kWh	Monthly Service Fee	Demand Charge	Preference Share
2 Tier	\$0.15, \$0.17	\$5.00	\$0.00	59%
TOU 3	\$0.09, \$0.22, \$0.46	\$0.00	\$0.00	41%

## Simulation C1

Rate Structure	Price Per kWh	Monthly Service Fee	Demand Charge	Preference Share
2 Tier	\$0.15, \$0.17	\$5.00	\$0.00	80%
TOU 3	\$0.09, \$0.22, \$0.46	\$5.00	\$0.00	20%

## Simulation C5

Rate Structure	Price Per kWh	Monthly Service Fee	Demand Charge	Preference Share
2 Tier	\$0.15, \$0.17	\$0.00	\$0.00	89%
TOU 3	\$0.09, \$0.22, \$0.46	\$5.00	\$0.00	11%



# Simulations: Effect of Monthly Service Fee

- A larger monthly service fee on the 2-Tier rate could drive more customers to a TOU rate with no monthly service fee.

## Simulation C3

Rate Structure	Price Per kWh	Monthly Service Fee	Demand Charge	Preference Share
2 Tier	\$0.15, \$0.17	\$10.00	\$0.00	41%
TOU 3	\$0.09, \$0.22, \$0.46	\$0.00	\$0.00	59%



# Simulations: Effect of Demand Charge

➤ Even a small demand charge affects preferences.

## Simulation C1

Rate Structure	Price Per kWh	Monthly Service Fee	Demand Charge	Preference Share
2 Tier	\$0.15, \$0.17	\$5.00	\$0.00	80%
TOU 3	\$0.09, \$0.22, \$0.46	\$5.00	\$0.00	20%

## Simulation C7

Rate Structure	Price Per kWh	Monthly Service Fee	Demand Charge	Preference Share
2 Tier	\$0.15, \$0.17	\$5.00	\$2.00	69%
TOU 3	\$0.09, \$0.22, \$0.46	\$5.00	\$0.00	31%

## Simulation C8

Rate Structure	Price Per kWh	Monthly Service Fee	Demand Charge	Preference Share
2 Tier	\$0.15, \$0.17	\$5.00	\$0.00	88%
TOU 3	\$0.09, \$0.22, \$0.46	\$5.00	\$2.00	12%



# Simulations: Change in Tiered Rate Plan

- Price per kWh is more impactful than rate structure.

## Simulation A1

Rate Structure	Price Per kWh	Monthly Service Fee	Demand Charge	Preference Share
3 Tier	\$0.11, \$0.20, \$0.29	\$5.00	\$0.00	79%
TOU 3	\$0.09, \$0.22, \$0.46	\$5.00	\$0.00	21%

## Simulation C1

Rate Structure	Price Per kWh	Monthly Service Fee	Demand Charge	Preference Share
2 Tier	\$0.15, \$0.17	\$5.00	\$0.00	80%
TOU 3	\$0.09, \$0.22, \$0.46	\$5.00	\$0.00	20%

## Simulation C9

Rate Structure	Price Per kWh	Monthly Service Fee	Demand Charge	Preference Share
2 Tier	\$0.18, \$0.19	\$5.00	\$0.00	74%
TOU 3	\$0.09, \$0.22, \$0.46	\$5.00	\$0.00	26%



# Simulations: Low vs. High price/kWh Levels

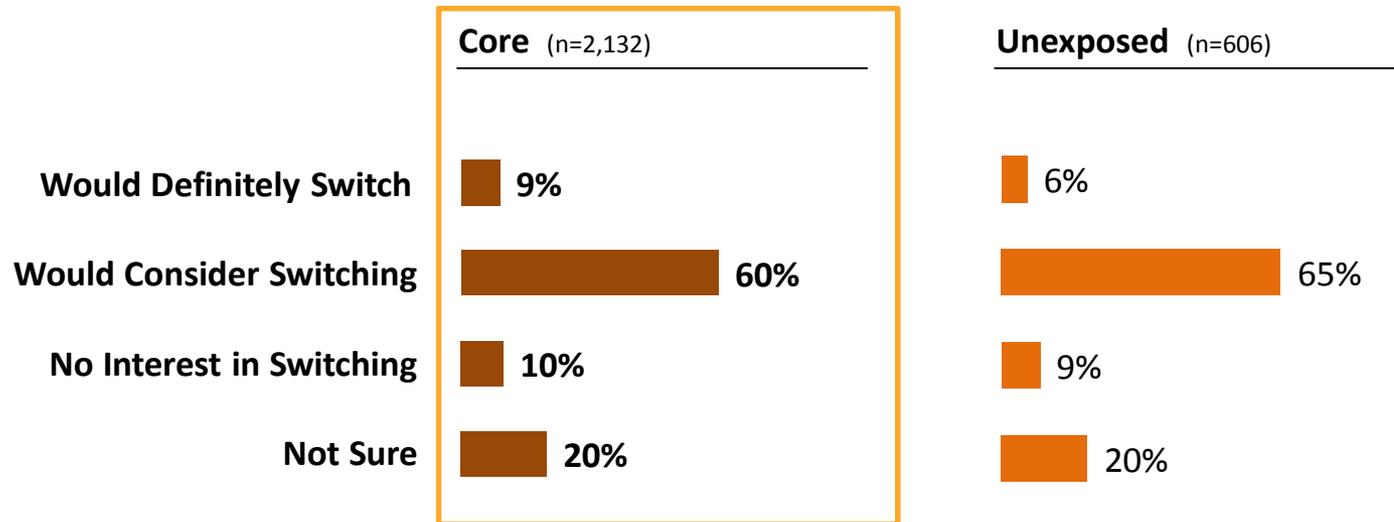
- Preferences for a monthly service fee with low price per kWh levels varies by rate structure.

Simulation #	Rate Structure	Price Per kWh (\$)	Monthly Service Fee	Demand Charge	Preference Share
D1-5	2 Tier	.12, .14	\$5.00	\$0.00	46%
D1-5	2 Tier	.18, .19	\$0.00	\$0.00	54%
D2-5	3 Tier	.10, .12, .16	\$5.00	\$0.00	73%
D2-5	3 Tier	.20, .24, .29	\$0.00	\$0.00	27%
D3-5	TOU 2	.12, .14	\$5.00	\$0.00	72%
D3-5	TOU 2	.22, .26	\$0.00	\$0.00	28%
D4-5	TOU 3	.12, .13, .16	\$5.00	\$0.00	66%
D4-5	TOU 3	.18, .24, .26	\$0.00	\$0.00	34%
D4-10	TOU 3	.12, .13, .16	\$10.00	\$0.00	44%
D4-10	TOU 3	.18, .24, .26	\$0.00	\$0.00	56%



# Interest in Switching

- After choosing a preferred rate plan option thirteen times, respondents were asked how likely they would be to actually switch from their current rate plan.
  - Only 10% of the Core had no interest in switching from their current rate, indicating 90% were open to considering a new rate.
  - 9% of the Core would definitely switch versus 6% of the Unexposed, suggesting that education can strengthen customer intent to switch to a new rate.



# Tolerance for Bill Increase

About one-third (36%) of the Core a monthly bill increase of less than \$20 gets their attention. The median is in the \$20-\$29 range, which compared to the median summer electric bill of \$90 is in excess of 20%.

- CARE customers react to lower amounts but their median summer bill (\$60) is much lower as well, so they also respond to changes in excess of 20%.

<u>Amounts</u>	<u>Core</u> (n=2,132)	<u>CARE</u> (n=351) a	<u>Non-CARE</u> (n=1781) b
	\$0 to \$9	13%	20% b
\$9 to \$19	23%	30% b	21%
\$20 to \$29	22%	21%	23%
\$30 to \$39	11%	8%	11%
\$40 to \$49	8%	6%	8%
\$50 to \$74	9%	5%	10% a
\$75 to \$100	3%	2%	3%
More than \$100	7%	4%	9% a
Not sure	5%	4%	5%



# Willingness to Risk Bill Impacts

- Customers are split concerning their willingness to assume more bill risk
  - The majority (40%) are clearly risk averse
  - About one in four (23%) were willing to risk +/- 15% or more.
  - Fewer (18%) of the Unexposed were willing to risk +/- 15% or more, further indication of the impact of education on willingness to try a new rate.

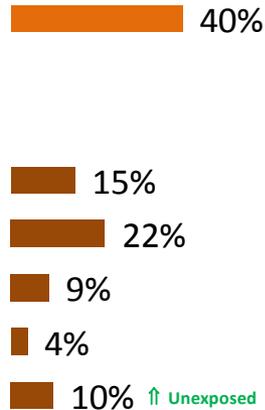
## Potential Bill Impacts

**Not willing to risk higher bill for potential savings**

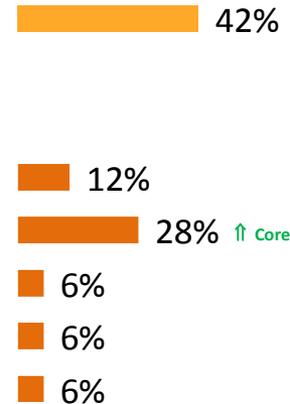
**Willing to risk higher bill for potential savings...**

5 % increase or decrease  
 10% increase or decrease  
 15% increase or decrease  
 20% increase or decrease  
 25% increase or decrease

### Core (n=2,132)

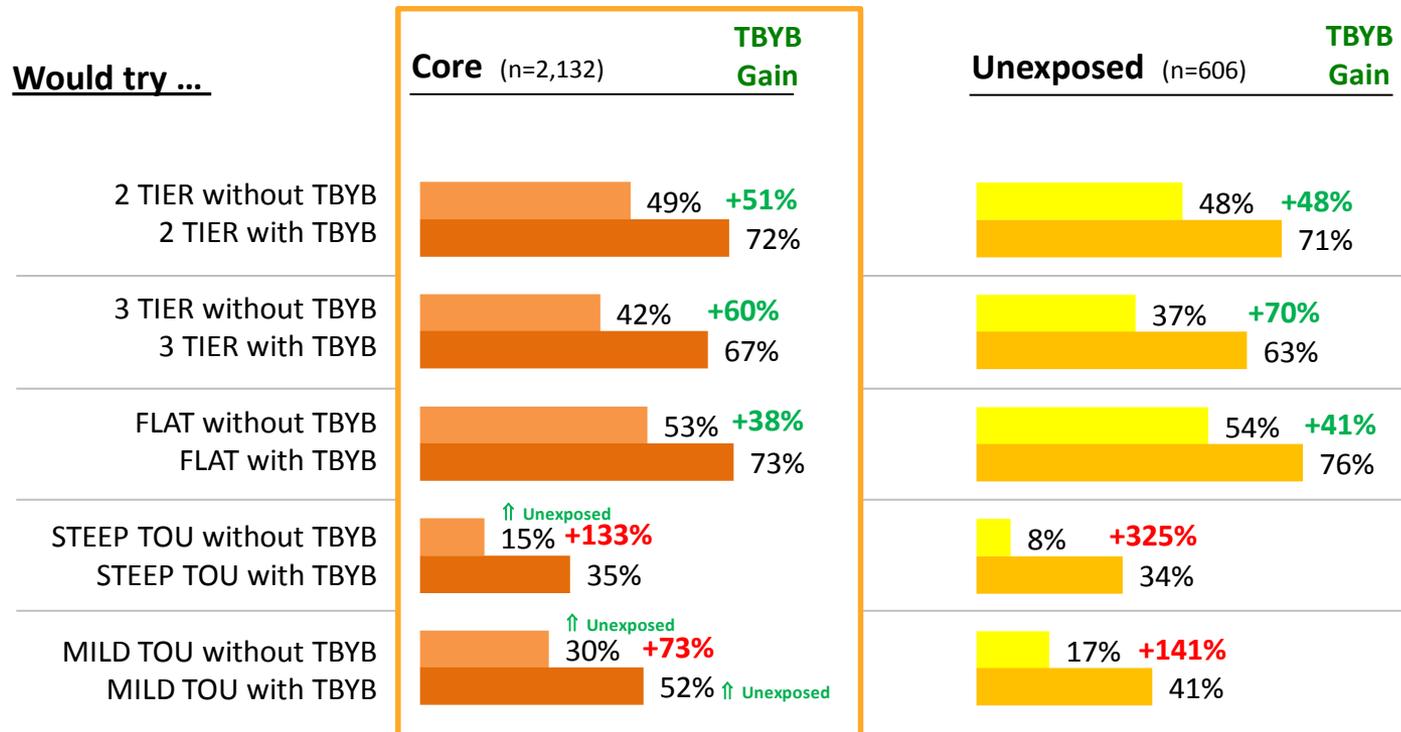


### Unexposed (n=606)



# Effect of Bill Protection

- Bill protection (e.g., Try-Before-You-Buy) could help overcome risk aversion
  - TBYB was especially effective in increasing willingness to try TOU rates
  - TBYB was especially effective in encouraging Unexposed to try TOU rates



# Jurisdictions Outside CA

	CA IOU Core	SRP / APS	Hydro One
<b>Progress Transitioning Customers</b>			
Migration Approach	None	Opt-in over time	Completing Default of all Res Customers
On TOU Rate	<5%	30-40%	~100%
<b>Attitude and Acceptance of TOU Rates</b>			
Aware of TOU rates	40%	85%	90%
Believe they are on a TOU rate	19%	64%	84%
Think TOU is the best rate	22%	55%	50%
Believe they saved money by shifting	74%	75%	76%
<b>Satisfaction (Top 3 Box)</b>			
Availability of Meaningful Rate Plan Options	41%	63%	23%
Timely Rate Change Communications	41%	51%	28%
Rate Plan Education	33%	48%	19%
Keeping the Lights On	64%	80%	41%
Highly Satisfied with Utility	59%	76%	37%



# Rate Plan Option Education

- There were some slight differences in rate plan characteristic preferences for the Unexposed respondents that were not provided information on rate plan options versus the Core group:
  - “Saving money” and “Understandable” were somewhat less important
  - “Predictable” was somewhat more important
- The Core group was more certain about switching to a new rate than the Unexposed group, implying rate education can reduce customer inertia:
  - 9% of the Core group would definitely switch compared to only 6% of the Unexposed group
- The Unexposed respondents were similar in risk aversion to potential bill increases but were less likely to be willing to take a relatively large risk than the Core group:
  - Not willing to risk a higher bill for a lower bill
    - Core: 40%
    - Unexposed: 42%
  - Willing to risk +/-25%
    - Core: 10%
    - Unexposed: 6%
- “Try Before You Buy” had a much larger impact on Unexposed respondents willingness to try a new TOU rate plan, especially a steep TOU rate plan
  - Core: increased 133% from 15% to 35%
  - Unexposed: increased 325% from 8% to 34%



# CARE / FERA

- Although CARE customers are somewhat more risk averse than non-CARE customers, they are more likely to take action to save or shift energy, and the majority (63%) are willing to consider new rate options
  - CARE customers are likely to take action
    - 80% believe they have been successful in reducing their bill by shifting
    - 78% think they can shift more in the future
  - CARE customers are more risk averse than non-CARE customers, but 63% still willing to consider new rate options
    - More likely to be completely risk averse (49% versus 39% non-CARE)
    - Somewhat less likely to consider new rate options (63% versus 72% non-CARE)
- Consistent with their rate preferences, CARE customers are more likely to say they would prefer a tiered rate than the non-CARE Core, and less likely to prefer a TOU rate
- CARE customers tend to be more satisfied with their IOU regarding rate options and rate communications than the rest of the Core sample population



# Spanish Speakers

- Spanish-speakers are the most favorable sub-group toward their utility, though Hispanics do tend to give higher ratings in surveys in general.
- Not unexpectedly, they are less knowledgeable about current rates, especially concerning Time-Of-Use. This could be why they tended not to choose TOU when asked (near the beginning of the survey) which rate would work best.
- They reported trying to save money on their bill by reducing and shifting in proportions similar to the Core, but are more likely to say they have been successful in reducing their bill by doing so.
- The importance they placed on factors for choosing a rate plan differed from the Core as well – with Spanish-speakers placing less importance on *stable, simple, and predictable*, and more on *green, fair, and reflects the cost of electricity*.
- Following the survey questions designed to educate respondents, Spanish-speakers' conjoint choices were quite similar to the core, although they indicated greater willingness to switch rates, and to take on more risk in order to save than the Core.



# Engaged Customers

- Not surprisingly, SmartRate and PG&E Solar customers were much more aware of TOU rates than the Core group
  - All SmartRate customers are on a “time-varying rate” so are familiar with rates that vary by time of day
  - ~45% of PG&E’s solar customers are on a TOU rate
- However, both groups were less satisfied than the Core group about their rate plan options, communications and education
  - SmartRate customer satisfaction with the SmartRate program itself is high
- There were some large differences in rate plan characteristic preferences compared to the Core group:
  - Both SmartRate and Solar customers placed higher importance on “Reflects Cost of Electricity”
  - SmartRate customers placed even more importance on “Saving Money”
  - Solar Customers placed higher importance on “Works for Me” and “Green”
- Engaged customers were also less risk averse than the Core
  - Fewer respondents unwilling to risk a bill increase for the potential of a bill decrease
  - More respondents willing to try TOU rates (steep and mild)



# Other CA Jurisdictions

	CA IOUs	SMUD	LADWP	Riverside
Monthly Service Fee >\$1	No	\$10	No	\$8
Think There is a Monthly Service Fee	38%	29%	31%	49%
Demand Charge	No	No	No	\$10 - \$60
Think There is a Demand Charge	13%	7%	7%	17%
<b>Satisfaction (Top 3 Box)</b>				
Availability of Meaningful Rate Plan Options	41%	45%	19%	47%
Timely Rate Change Communications	41%	51%	30%	47%
Rate Plan Education	33%	39%	13%	35%
Keeping the Lights On	64%	76%	57%	76%
Highly Satisfied with Utility	59%	73%	45%	73%

- Even though SMUD and Riverside have Monthly Service Fees, respondent awareness was relatively low
- SMUD and Riverside respondents similar to the Core group in satisfaction levels except for
  - SMUD respondents were more satisfied with rate plan option education and communications
- LADWP customers were the most dissatisfied across all measures
- Minor differences in rate plan characteristic preferences compared to the Core group
  - SMUD respondents placed more importance on “Works for Me” and “Reflects Cost of Electricity”
  - LADWP respondents place more importance on “Green”



# Other CA Jurisdictions

- Regarding their current knowledge about the different rate structures, SMUD customers are more likely to know about different rate structures than the Core, while LADWP are less likely. Riverside customers are similar to the Core. Among the three, Riverside customers are the most likely to believe TOU would work for them.
- All three muni customer groups are similar to the Core in terms of those who say they tried to save money by reducing or by shifting, but they are less likely to believe they actually did save money.
- Consistent with relatively similar factors, their rate preferences are similar to the Core as well.
- Riverside customers are more likely to say they would switch rates than the Core, yet all three muni customer groups have risk tolerance that is similar to the Core.



# Seniors

- Seniors are among the more knowledgeable of customers
  - Greater awareness of Tiered and TOU rates
  - More likely to know they have a tiered rate compared to those 44 or younger
  - Less likely to believe they currently have a service charge for either electric or gas service
- Seniors who try to save money on their bill by reducing or shifting are less likely than younger customers to believe they have been successful
- Seniors place higher importance on rates that are *simple, understandable, and reflect the cost of electricity* than do younger customers
  - Those 44 or younger place higher importance on *stable, green, and fair*
- Seniors are also less likely to switch rate plans
  - Only 3% said they would definitely switch, compared to 9% of those 45-64, and 13% of those 44 and younger
  - They are more risk averse, especially compared to those 44 or younger
  - They are less swayed by TBYB



# Households with Disabled Member

- Households with a disabled member have similar current rate knowledge as other households, yet
  - Disabled households are more likely to say they would switch from their current rate
  - More likely to think that a flat rate would work best for them
- Though households with a disabled member have similar rates of trying to save money on their bill by reducing or shifting than other households, they are more likely to believe their efforts have paid off with savings on their bills

- 26% of respondents reported someone in their household having some level of disability

	<b>Core</b> (n=2,132)	<b>PG&amp;E</b> (n=717)	<b>SCE</b> (n=715)	<b>SDG&amp;E</b> (n=700)
		a	b	c
<b>Chronic disease</b>	<b>34%</b>	42% bc	28%	27%
<b>Mobility</b>	<b>26%</b>	22%	30%	21%
<b>Hearing</b>	<b>14%</b>	15%	14%	13%
<b>Vision</b>	<b>12%</b>	13%	10%	13%
<b>Psychological</b>	<b>11%</b>	9%	13%	8%
<b>Cognitive</b>	<b>5%</b>	6%	3%	9%
<b>Other</b>	<b>9%</b>	8%	11%	10%
<b>Prefer Not to Answer</b>	<b>21%</b>	18%	22%	28%



# Conclusions

- Because customer satisfaction with rate plan options and rate education is modest at best, many customers are likely to respond favorably to
  - New rate plan options that “fit” their household situation
  - Communications about rate plans
- Understanding of current rate plan and awareness of rate plan options is poor, however
  - Customers were able to make thoughtful rate choice decisions without rate education
  - Rate education and bill protection can both help overcome risk aversion and encourage adoption of alternative rate plan options



# Conclusions

- The majority of customers want rate options that can help them save money on their bill and they understand the need to take action to change their energy use behavior
  - Respondents are very familiar with shifting load, and many are willing to try a TOU rate that works for them
  - However, overall rate preferences leaned toward a less risky flat rate followed by a mild 2-tier rate
- 70% - 75% would consider switching, but customer inertia factors are in play
  - Awareness and understanding of rate plan options
  - Bill savings expectations
  - Risk tolerance
  - Attractiveness of relative rate plan attributes
- There is a sizable group of customers that are willing to risk a bill increase for the potential of a bill decrease
  - The challenge is designing a TOU rate plan option that is appealing enough to encourage migration from the standard rate



# Conclusions

## ➤ Rate Attributes and Levels:

- Monthly service fees can heavily impact customer choice of rate plans
- Customers are influenced more by price per kWh levels and differentials associated with the alternative rate structures than by the rate structures themselves
  - Customers believe price per kWh levels have more impact on their bills than any particular rate structure
  - Overall rate structure preference was: 1) Flat, 2) 2-Tier, 3) TOU 2, 4) 3-Tier and 5) TOU 3
  - Customers may be willing to consider a variety of rate structures focusing on the kWh price levels and monthly service fees

## ➤ Rate Structures:

- Tiered rate structures
  - Greater preference for steeper rather than narrow tier price per kWh differentials in a 3 Tier rate
  - kWh price differential between tiers less of an influence than the 2 Tier rate itself
  - Price per kWh levels become less important for a 2-tiered rate, but this may be a reflection of the fairly narrow range in levels tested
- TOU rate structures
  - A 2-period TOU rate structure is preferred slightly more than a 3 tiered rate, all other attributes equal
  - Respondents largely indifferent between wide and narrow price differentials in the TOU 2 rat
  - Wide price per kWh level for TOU 2 may be preferred over narrow for TOU 3 - a simpler steep TOU rate could better overcome risk aversion



*Sample Detail*

*Age, Income, Gender*

*Education, Ethnicity*

*Number in Household, Employment Status*

*Someone with a Disability, Own or Rent, Type of Home*

## Respondent Characteristics



# Sample (Unweighted)

Core IOU	PG&E	SCE	SDG&E	Total
English	666	665	650	1981
Spanish	51	50	50	151
<b>Total</b>	<b>717</b>	<b>715</b>	<b>700</b>	<b>2,132</b>

Supplemental IOU Groups	PG&E	SCE	SDG&E	Total
Unexposed	203	202	201	606
Low Income Phone/Mail Recruits	69	70	29	168
Spanish Speakers	--	197	35	232
Solar	228	228	209	665
High Engagement	254	--	226	480
<b>Total</b>	<b>752</b>	<b>697</b>	<b>902</b>	<b>2,151</b>

Other Jurisdictions	SMUD	LADWP	Riverside	Total
Inside CA	212	202	207	<b>621</b>

Other Jurisdictions	Hydro One	Arizona		Total
Outside CA	200	200		<b>400</b>



# Respondent Characteristics: Core

Respondent demographics are shown here and on the following charts.

- Quotas were used to match age and income to the population. Weighting was used to match education and gender. Weighting was completed within each utility, which modified some of the age and income proportions, as shown below.
- In sum, the sample is a close approximation to the population.

Age	Core (n=2,132)	PG&E (n=717)	SCE (n=715)	SDG&E (n=700)	Income	Core (n=2,132)	PG&E (n=717)	SCE (n=715)	SDG&E (n=700)
		a	b	c			a	b	c
18 to 24	6%	8% b	3%	7% b	Less than \$30,000	32%	37% bc	30%	25%
25 to 34	17%	19%	16%	16%	\$30K to < \$75K	38%	34%	41% a	45% a
35 to 44	16%	16%	17%	16%	\$75,000 or more	29%	29%	29%	30%
45 to 54	13%	11%	14%	17% a	Gender				
55 to 64	29%	29%	31%	28%	Female	60%	60%	60%	60%
65 to 74	14%	14%	15%	11%	Male	40%	40%	40%	40%
75 or older	4%	4%	4%	4%					



# Respondent Characteristics: Core

Education was weighted to match census population estimates.

- Because the panel sample under-represents those who did not graduate from High School, the category of “High School or less” is predominantly High School graduates.

Education	Core (n=2,132)	PG&E (n=717) a	SCE (n=715) b	SDG&E (n=700) c	Ethnicity	Core (n=2,132)	PG&E (n=717) a	SCE (n=715) b	SDG&E (n=700) c
High School or Less	40%	40%	40%	40%	White (not Hispanic)	64%	61%	65%	68% a
Trade/Technical/Some College	30%	30%	30%	30%	Hispanic or Latino	17%	18%	16%	18%
College Graduate	19%	19%	19%	19%	Asian/Pacific Islander	11%	13% c	10%	7%
Masters or Doctorate	11%	11%	11%	11%	African-American	2%	1%	3%	3%
					Native-American	1%	1% c	1%	<1%
					Mixed	2%	2%	2%	1%
					Other	1%	1%	1%	1%
					Prefer Not to Answer	2%	2%	2%	2%



# Respondent Characteristics: Core

Household and employment status of the respondent are shown here.

- About 6 out of ten (61%) are from 1 or 2 person households, with the remaining 39% from households with 3 or more.
- About half are employed either full or part-time, and about one in four (28%) are retired.

Number in Household	Core	PG&E	SCE	SDG&E	Employment Status	Core	PG&E	SCE	SDG&E
	(n=2,132)	(n=717)	(n=715)	(n=700)		(n=2,132)	(n=717)	(n=715)	(n=700)
		a	b	c			a	b	c
One	20%	21%	19%	20%	Employed Full Time	38%	35%	39%	43% a
Two	41%	40%	42%	38%	Employed Part Time	13%	14%	11%	17% b
Three	17%	17%	16%	19%	Unemployed	10%	11% c	10%	7%
Four	13%	13%	13%	12%	Homemaker	5%	5%	6%	5%
Five or more	9%	9%	10%	11%	Student	5%	6%	4%	3%
					Retired	28%	27%	29% c	24%
					Prefer Not to Answer	2%	2% c	1%	1%



# Respondent Characteristics: Core

Respondents were asked if someone with a disability resided in the home. One in four (26%) answered “yes,” and then provided the type of disability.

- About two-thirds (64%) of all respondents are homeowners and about the same proportion (62%) are in single-family homes. One in four (25%) lives in a multifamily residence.

Someone in Household Has a Disability	Core (n=2,132)	PG&E (n=717)	SCE (n=715)	SDG&E (n=700)	Own or Rent	Core (n=2,132)	PG&E (n=717)	SCE (n=715)	SDG&E (n=700)
Yes	26%	25% a	29% b	23% c	Own	64%	57% a	70% b	63% c
If yes: Type					Rent or Lease	36%	43% b	30%	37% b
Chronic disease	34%	42% bc	28%	27%	Type of Home				
Mobility	26%	22%	30%	21%	Single Family Detached	62%	61% c	65% c	52%
Hearing	14%	15%	14%	13%	Single Family Attached	7%	7%	6%	10% b
Vision	12%	13%	10%	13%	Apartment/Condo 2-4 Units	11%	11%	9%	14% b
Psychological	11%	9%	13%	8%	Apartment/Condo 5+ Units	14%	4%	13%	20% ab
Cognitive	5%	6%	3%	9%	Mobile Home	5%	5% c	5% c	2%
Other	9%	8%	11%	10%					
Prefer Not to Answer	21%	18%	22%	28%					



***PACIFIC GAS AND ELECTRIC COMPANY***  
***APPENDIX A.2.***  
***CUSTOMER RESEARCH METHODOLOGY***

## **CUSTOMER RESEARCH METHODOLOGY**

To achieve the research objectives, the survey utilized a quantitative research design that included a choice-based conjoint analysis. Conjoint analysis is a well-accepted customer research method used in product development and marketing across different industries and product categories. Conjoint analysis measures how people value different features that make up a product or service. The objective is to identify the combination of product attributes that are most influential in the customer decision making process. Conjoint analysis allowed the use of specific rate structure components as a basis for assembling rate plan options. In conjoint language, these would be called the “attributes” (e.g., volumetric charge, fixed service fee, demand charge, time-of-use periods). “Levels” specify potential variations within a particular attribute, such as different levels of monthly service fee (e.g., \$0, \$5, \$10). For three basic rate structures – time-of-use, inclining block, and flat - customers were asked to choose among a set of three rate plan options. The following is an example of one such task:

The respondents were provided definitions of rate structures and components in simple customer language before completing the choice exercises. The 82,000 rate plan options from the Core sample were then modeled using conjoint analysis, which provided insight into rate structures, components and levels that appeal to customers.

The customer sample included a group of ~700 respondents from each IOU service territory for a total of 2,132 Core respondents. All other groups, including additional IOU customers were compared to the Core group. To ensure a demographically representative sample, quotas were set based on age, gender, and income (including CARE customers). To further insure a representative sample,

additional weighting was applied to gender and education. A portion of the surveys were completed in Spanish using a targeted web-based panel to ensure that sufficient input was captured from Spanish-speakers. In addition, a separate sample of low-income/hard-to-reach customers who might not have online access were identified through address-based recruiting. This latter sample of 200 participants supplemented the 500 low-income customers within the 2,100 Core sample. As reflected in the tables below, other supplemental groups were recruited to compare to the core sample and identify any significant differences in energy use behavior and attitudes and rate option preferences.

<b>Core IOU</b>	<b>PG&amp;E</b>	<b>SCE</b>	<b>SDG&amp;E</b>	<b>Total</b>
English	666	665	650	1,981
Spanish	51	50	50	151
<b>Total</b>	<b>717</b>	<b>715</b>	<b>700</b>	<b>2,132</b>

<b>Supplemental Groups</b>	<b>PG&amp;E</b>	<b>SCE</b>	<b>SDG&amp;E</b>	<b>Total</b>
Unexposed	203	202	201	606
Low Income Phone Recruits	67	67	66	200
Spanish Speakers	–	200	200	400
Solar	228	228	209	665
High Engagement	254	–	226	480
<b>Total</b>	<b>752</b>	<b>697</b>	<b>902</b>	<b>2,351</b>

<b>Other Jurisdictions</b>	<b>SMUD</b>	<b>LADWP</b>	<b>Riverside</b>	<b>Total</b>
Inside CA	212	202	207	621
<b>Other Jurisdictions</b>	<b>Hydro One</b>	<b>Arizona SRP/APS</b>	<b>Total</b>	
Outside CA	200	200	400	

***PACIFIC GAS AND ELECTRIC COMPANY***

***APPENDIX A.3.***

***CUSTOMER SURVEY***

## **Residential Rates Customer Survey**

Survey length: 25 minutes

**Sample:** n=2,100 statewide general population (stratified 700 per IOU), plus additional subgroups 5,200 total.

	<b>PG&amp;E</b>		<b>SCE</b>		<b>SDG&amp;E</b>		<b>TOTAL</b>
English Speakers	650		650		650		<b>1,950</b>
Spanish Speakers	50		50		50		<b>150</b>
<b>Total General Population</b>	<b>700</b>		<b>700</b>		<b>700</b>		<b>2,100</b>
<b>Additional Samples</b>							
Spanish Speakers			200		100		<b>300</b>
Solar (NEM) Customers	200		200		200		<b>600</b>
More engaged and knowledgeable about electricity rates	SmartRate	200			200		<b>400</b>
Other CA Jurisdictions with alternative rate plan structures			SMUD	200			<b>600</b>
			LADWP	200			
			Riverside	200			
Outside CA Jurisdictions with significant penetration of TOU rates	Hydro One Canada	200			Arizona	200	<b>400</b>
Not exposed to rate education section in survey	200		200		200		<b>600</b>
Low income supplemental sample – not recruited via web	66		67		67		<b>200</b>
<b>Total Add'l Samples</b>	<b>866</b>		<b>1,267</b>		<b>967</b>		<b>3,100</b>
<b>Total</b>	<b>1,566</b>		<b>1,967</b>		<b>1,667</b>		<b>5,200</b>

## Introduction

Thank you for agreeing to participate in this online survey about electric rate plan options. There is no right or wrong answer to any of the survey questions posed. We simply want your opinion. Your individual answers will remain confidential.

The utilities and state regulators are exploring possible changes to the way they charge their customers for electricity. Your responses will assist in determining what, if any, changes should be made.

This survey should take about 25 minutes to complete. Most participants will complete this survey in one sitting, but you can stop and resume from the same point at a later time by clicking on the link from the survey invitation.

If you need to stop and then return to the survey, please click on the link that brought you to this survey after you have close your browser. This will bring you to the question you last answered.

S2 Which of the following companies provides your household electricity? [ONE ONLY]

### CALIFORNIA SAMPLES

Anaheim Public Utilities .....	
Imperial Irrigation District .....	
Los Angeles Department of Water & Power (LADWP).....	*
Pacific Gas & Electric Company (PG&E) .....	*
Pasadena Water & Power .....	
Riverside Public Utilities .....	*
Sacramento Municipal Utility District (SMUD) .....	*
Southern California Edison (SCE) .....	*
San Diego Gas & Electric Company (SDG&E) .....	*

### ARIZONA SAMPLES

Arizona Public Services (APS) .....	*
Salt River Project (SRP) .....	*
San Carlos Irrigation.....	
Tucson Electric Power .....	
Unisource Energy Services .....	

### ONTARIO CANADA SAMPLES

Hydro One.....	*
Some other company .....	

[NEED ONE OF THE “\*” OPTIONS]

**Section 0 – Screening**

S1 In your household, which of the following activities are you involved in? [MULTIPLE RESPONSE OK] <use right term for **electric / gas bill** for PG&E and SDG&E participants, **electric bill** for all other participants throughout survey) >

Reviewing and/or paying the monthly <b>electric</b> bill.....	1	NEED
Calling your <b>electric</b> utility company when there is a problem .....	2	
Making decisions about programs, payments, and other options provided by your <b>electric</b> utility.....	3	NEED
None of the above .....	4	TERM

[NEED PUNCH 1 or 3]

S2 To ensure we represent a variety of opinions, which of the following industries do you or other primary earners in your household work for? *Please select all that apply.*

Agriculture .....	2	OK
Banking / insurance / financial services .....	3	OK
Business or professional services / consulting.....	5	OK
Construction / home improvement / contractor .....	6	OK
Education .....	7	OK
Entertainment.....	9	OK
City, County, State, or National government.....	10	OK
Healthcare.....	11	OK
High technology / computer programming .....	12	OK
Hospitality / food services .....	14	OK
Manufacturing.....	15	OK
Market research/Marketing/advertising .....	16	TERM
Retail.....	18	OK
Utilities such as electrical or gas power companies .....	20	TERM
Retired.....	21	OK
Unemployed .....	22	OK
None of these.....	23	OK

S3 Including you, how many people live in your household?

\_\_\_\_\_ (NUMBER BETWEEN 1 AND 20)

S4 About how many square feet is your home?

Under 1,000.....	1
1,000 to 1,499.....	2
1,500 to 1,999.....	3
2,000 to 2,499.....	4
2,500 to 2,999.....	5
3,000 to 3,499.....	6
3,500 or more .....	7
Not sure .....	8

S5	What is your age?	
	18-24 .....	1
	25-34 .....	2
	35-44 .....	3
	45-54 .....	4
	55-64 .....	5
	65-74 .....	6
	75 or older .....	7
	Prefer not to answer .....	9
S6	What is your annual household income before taxes? This information will help us better understand your answers. [NOTE: NEEDED TO DETERMINE ELIGIBILITY FOR CARE DISCOUNT QUESTIONS]	
	Less than \$15,000 .....	1
	\$15,000 to just less than \$22,000 .....	2
	\$22,000 to just less than \$30,000 .....	3
	\$30,000 to just less than \$38,000 .....	4
	\$38,000 to just less than \$46,000 .....	5
	\$46,000 to just less than \$54,000 .....	6
	\$54,000 to just less than \$62,000 .....	7
	\$62,000 to just less than \$75,000 .....	8
	\$75,000 to just less than \$100,000 .....	9
	\$100,000 to just less than \$200,000 .....	10
	\$200,000 or more .....	11
S7	Are you male or female?	
	Male .....	1
	Female .....	2
S8	What is your zip or postal code? _____	

**Section 1 – Electric Utility Evaluations**

1.1 Using a 10-point scale, where 1 means you are extremely dissatisfied, and 10 means you are extremely satisfied, how would you rate your satisfaction with [FROM S2: PG&E, SCE, SDG&E, Salt River Project, Arizona Public Service, Hydro One, ETC.] when it comes to ... ? [Randomize statements][1-10 SCALE, Not Sure]

- a. Availability of rate plans to suit your specific needs
- b. Charging a fair price for electricity services
- c. Communicating rate changes in a timely manner
- d. Educating you on the benefits of different rate plans
- e. Keeping my lights on / no power outages

1 Extremely Dissatisfied .....	1
2 .....	2
3 .....	3
4 .....	4
5 .....	5
6 .....	6
7 .....	7
8 .....	8
9 .....	9
10 Extremely Satisfied .....	10
Not sure .....	99

1.2 Using a 10-point scale where 1 means your feelings are not at all favorable and 10 means your feelings are extremely favorable, how would you rate your overall satisfaction with the service provided by [FROM S2: PG&E, SCE, SDG&E, Salt River Project, Arizona Public Service, Hydro One, ETC.].

1 Not At All Favorable.....	1
2 .....	2
3 .....	3
4 .....	4
5 .....	5
6 .....	6
7 .....	7
8 .....	8
9 .....	9
10 Extremely Favorable.....	10
Not sure .....	99

## **Section 2 - Rate Knowledge, Preferences, Behaviors**

The next questions will help us understand what you currently know about the way you are charged for electricity use. It's okay if you are not that familiar with this subject. If you are not sure of an answer, just select the option "not sure."

- 2.1a Which of the following electric rate plans have you heard about before this interview? *Check all that apply.* [ROTATE]

Flat rate, meaning you pay the same price for each unit of electricity regardless of when you use it or how much you have used during the month	1
Tiered rate, meaning your price for each unit of electricity may increase over the month if you use more than a certain amount of electricity	2
Time of Use rate, meaning you pay a different price for each unit of electricity depending on the time of day you use that electricity	3
Not sure	4

- 2.1b Which of the following best describes your electric rate plan for your home? *Check all that apply.* [ROTATE]

Flat rate, meaning you pay the same price for each unit of electricity regardless of when you use it or how much you have used during the month	1
Tiered rate, meaning your price for each unit of electricity may increase over the month if you use more than a certain amount of electricity	2
Time of Use rate, meaning you pay a different price for each unit of electricity depending on the time of day you use that electricity	3
Something else: Describe	4
Not sure	5

- 2.1c Which of the following rate plans would work best for you? [ROTATE]

Flat rate, meaning you pay the same price per unit regardless of when you use it or how much you have used during the month	1
Tiered rate, meaning your price per unit increases over the month as you use more electricity	2
Time of Use rate, meaning you pay a different price per unit depending on the time of day you use electricity	3
Something else: Describe	4
Not sure	5

**<2.2 and 2.3 only for group that will not be exposed to the Section 3 rate education section>**

2.2 Which of the following best describes your current attitude toward taking steps to lower your electric bill? [ROTATE]

You have little interest in trying to reduce your electric bill	1
You would like to do more to reduce your electric bill, but you are doubtful that further steps would be effective	2
You would like to do more to reduce your electric bill, and you are interested in new ideas	3
You have done a lot in your home to save electricity, and there is not much more that can be done	4
Not sure	5

2.3 How would you rate your interest in *taking additional steps* to reduce your household's electric bill? Use the following 10-point scale where 10 means you are extremely interested and 1 means you are not at all interested.

1 Not at all Interested	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10 Extremely Interested	10
Not sure	99

2.4 How much of a savings on an annual basis would it take to get you to switch to a new rate plan?

\$\_\_\_\_\_ [Annual AMOUNT] \$0-\$1000

### Section 3

#### Introduction to Electric Rate Plans

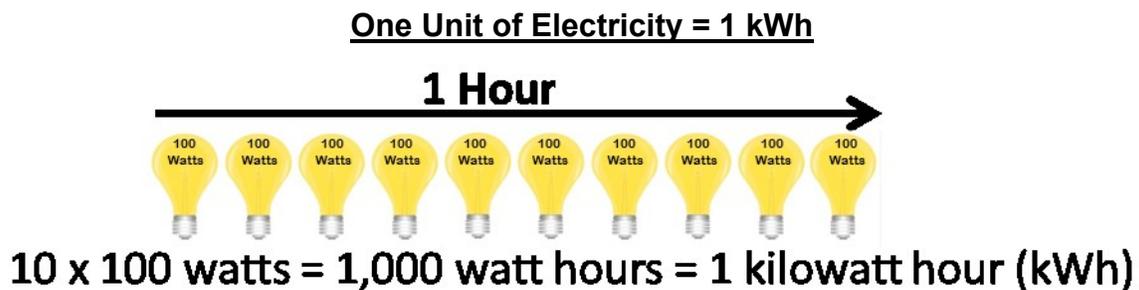
**<SKIP SECTION 3 FOR GROUP THAT DOES NOT GET EXPOSED TO EDUCATIONAL INFORMATION ABOUT RATE PLAN STRUCTURES>**

#### kWh / ENERGY USE BEHAVIOR

Currently, you buy and use electricity by the kilowatt-hour (kWh), just as you buy gasoline by the gallon, and cell phone service by the minute.

#### 1 kWh = 1 Unit of Electricity

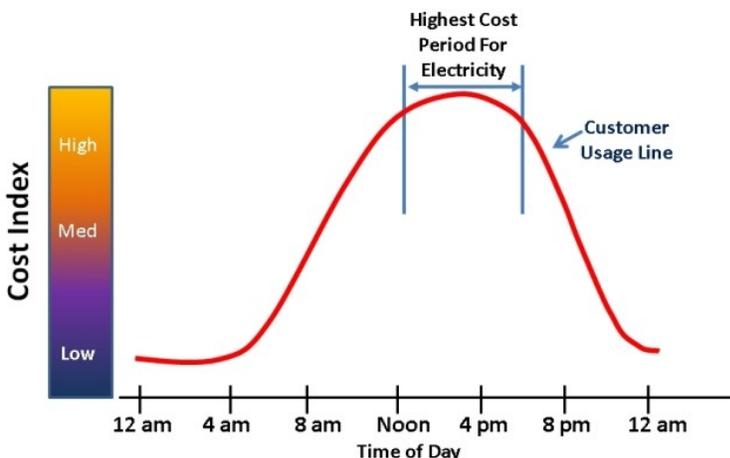
It takes one unit of electricity (one kWh) to burn ten 100-watt light bulbs for one hour. Conversely, in order to save one unit of electricity (one kWh) you would need to reduce your electricity use by an amount equivalent to burning ten 100-watt light bulbs for one hour.



#### **<For California participants only>**

*Note: 100 watt light bulbs are no longer sold in California. Using 60 watt light bulbs, you would need to turn off 17 light bulbs to save one kWh.*

#### **The Cost to Generate Electricity**



- The cost of fuel used for power generation is a major component of the price of electricity.
- As total demand for electricity by all customers increases, utility companies must generate electricity using more costly resources.
- During the “peak” period of the day when the most electricity is being used by customers, the cost is significantly higher.
- And during exceptionally high demand days expensive and less environmentally friendly “peaker” plants need to be brought online.
- In addition, when the peak grows over time, new costly generation plants must be built.

### Energy Use Behaviors

With all rate plans, if you *reduce* your electricity use overall, you can save money. Some rate plans also reflect the range in cost to generate electricity during the day, by saving you money when you *shift* your electricity use away from peak demand periods.

3.1a In the past, have you tried to save money on your bill by reducing your electricity use or by shifting your electricity use to a different time of day? RANDOMIZE

	Never	Sometimes	Often
Tried to save money on my bill by reducing my electricity use	1	2	3
Tried to save money on my bill by shifting my electricity use	1	2	3

**<The next question should only show when the participant did not answer “Never”. If they answered Never once, than that activity should not show in the next question.>**

3.1b How much savings have you noticed on your bill from reducing or shifting your electricity use to a different time period when you...? RANDOMIZE

	A Lot	A Little	None
Tried to save money on my bill by reducing my electricity use	1	2	3
Tried to save money on my bill by shifting my electricity use	1	2	3

## How your charges vary by type of rate plan

This survey investigates three kinds of rate plans that charge for electricity in different ways:

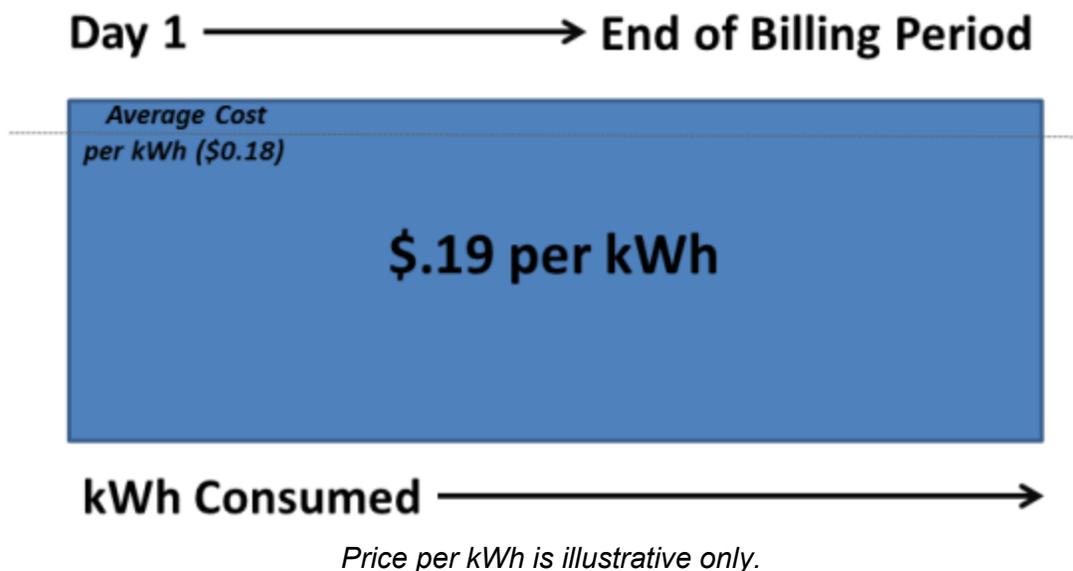
- Flat Rate Plan
- Time-of-Use Rate Plan
- Tiered Rate Plan

We're also investigating a couple different types of charges: Monthly Service Fees and Demand Charges. There will be a section for each of these.

### <Randomize order of FLAT and Tiered>

#### Flat Rate Plan

- The price you pay for each unit of electricity (kWh) does not change no matter how much or when you use it during the billing period.
- You can save money by using less electricity (e.g., by installing energy efficient light bulbs and appliances, or turning off lights), but not by shifting your usage between different time periods of the day.
- You may pay a higher rate than average cost, but you are also less likely to have unexpected bill increases from month to month and season to season.



#### Tiered Rate Plan

- A certain allowance of electricity is available at the beginning of each monthly billing period at a low rate.
- If you consume more than this allowance, you move into higher blocks of electricity called “tiers.”
- The price per unit (kWh) increases in each higher tier.

- The average price per unit (kWh) you pay during the monthly billing period, (along with what you can save on your bill by reducing your electricity usage) will depend on the total amount of electricity you have used, and the tier that you have reached by the end of the monthly billing period.
- You can save money on your bill by using less electricity over the monthly billing period (e.g., by installing energy efficient light bulbs and appliances, or turning off lights). This will reduce your overall usage and can also help you to avoid or delay going into higher priced “tiers”.
- Shifting your energy use to other time periods during the day would not affect your bill.
- Tiered rate plans incentivize people to use less electricity which can help the environment because it means less harmful emissions are released into the air.
- Tiered rate plans range from having 2 to 5 tiers and associated increasing prices per kWh.

Two-Tiered Rate Plan	Three-Tiered Rate Plan
<p>Day 1 —————&gt; End of Billing Period</p> <p>Tier 1 Initial Allowance      Tier 2</p> <p>Average Cost per kWh (\$0.18)</p> <p>\$0.16 per kWh      \$0.20 per kWh</p> <p>kWh Consumed —————&gt;</p>	<p>Day 1 —————&gt; End of Billing Period</p> <p>Tier 1 Initial Allowance      Tier 2      Tier 3</p> <p>Average Cost per kWh (\$0.18)</p> <p>\$0.13 per kWh      \$0.15 per kWh      \$0.30 per kWh</p> <p>kWh Consumed —————&gt;</p>
<ul style="list-style-type: none"> <li>• Lower price for an initial allowance of electricity.</li> <li>• Higher price for all additional electricity used.</li> </ul>	<ul style="list-style-type: none"> <li>• Lowest price for an initial allowance in the first tier.</li> <li>• Price increases in the second and third tiers.</li> <li>• You can pay up to three different prices in any billing period.</li> </ul>

*Prices per kWh and tier timeframes are illustrative only. When during the billing period you would move into Tier 2 will depend on how much electricity you consume.*

### 3.2

A) Which energy saving actions have you done in your household in the past 5 years?

B) Which do you think you realistically could implement or do more of in the future?  
 Check all that apply. RANDOMIZE

	A) Done in the Past?	B) Can do in the Future?
Installing and using a programmable thermostat		
Replacing or cleaning furnace / air conditioning filters		
Reducing air conditioning temperature settings on the thermostat		

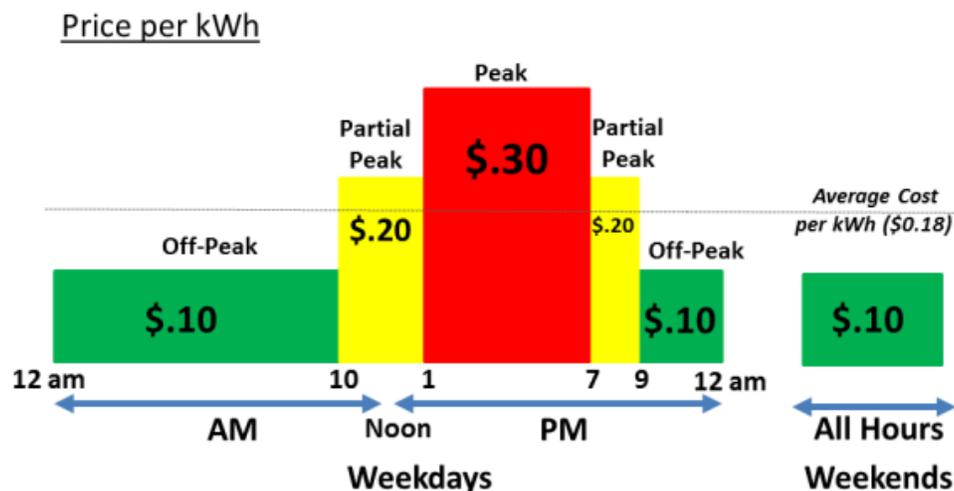
Unplugging appliances when not in use		
Installing and using energy saving power strips		
None of these		

3.3 Which of the following rate plans do you think would work the best for you?  
Choose One:

Flat Rate Plan (no tiers)	
Two-tier Plan	
Three-tier Plan	
No Preference	

Time-of-Use Rate Plan

- The price per unit of electricity (kWh) varies depending on the time of day.
- Prices are higher during periods when total system demand for electricity is the highest, typically in the afternoon and early evenings during the week.
- Prices per kWh are lower when people use less electricity, typically in the early mornings, nights and weekends.
- You may be able to save money on your bill by minimizing your energy use during peak times of day by using appliances only during off-peak times like early morning, late evening and weekends.
- Conversely, if you cannot shift or reduce your electricity usage during peak periods, you may have a higher bill.
- Because TOU rate plans charge higher prices during peak periods, people use less energy while the cost is high, which can help the environment and lower electricity prices for everybody because fewer new power plants need to be built.
- TOU rate plans typically have either two or three periods. The example below shows a three period TOU rate plan.



Prices per kWh are illustrative only.

3.4 1) Which of these do you currently have in your household? *Check all that apply.*

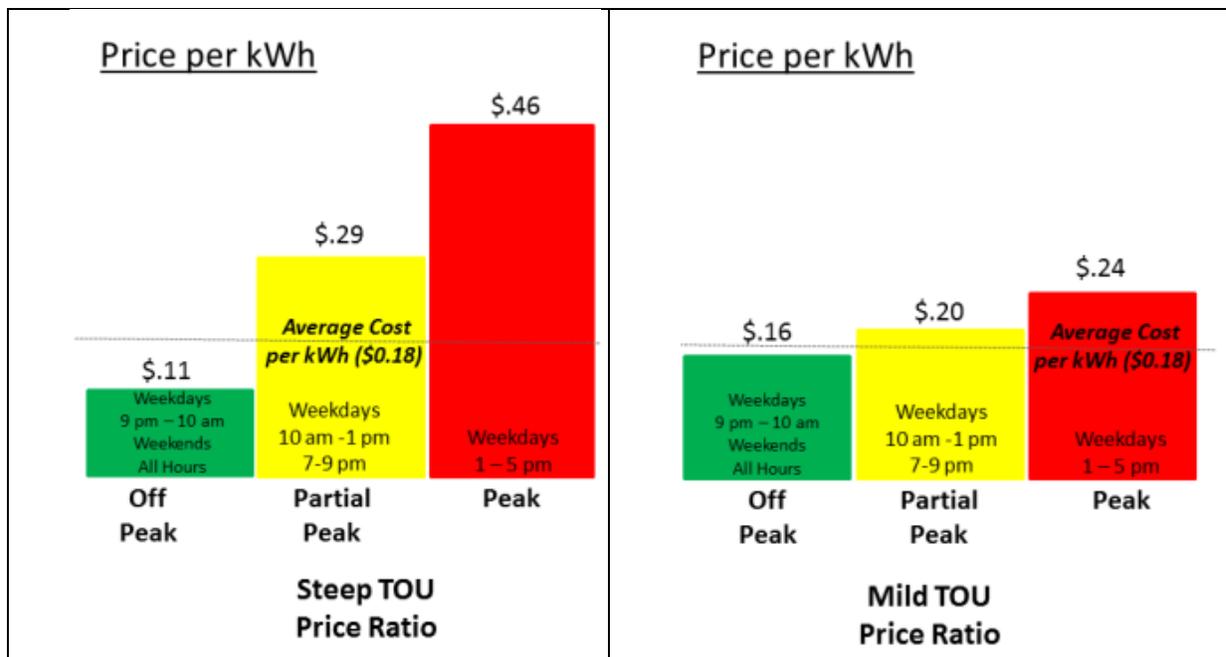
2A) In the past, have you shifted operation of this end use away from peak demand periods? *Check all that apply.*

2B) In the future, can you shift operation of this end use away from peak demand periods. *Check all that apply.*

	Have in my house	A) Have shifted use in the past away from peak period	B) Can shift in the future away from peak period
Clothes Washer			
Pool Pump			
Air Conditioner			
Electric Stove			
Electric Oven			
Electric Heater			
Television(s)			
Computer(s)			
Video Game Console(s)			

Time-of-Use Rate Plan Pricing

A Time-Of-Use rate plan may be “steep” where the price difference between the periods is greater, or “mild” where the price difference between the periods is smaller.



<ul style="list-style-type: none"> <li>Your bill can be a lot higher if you do not reduce electricity use during peak times, but it can be a lot lower if you can reduce your electricity use during the peak.</li> <li>If you are typically home on afternoons during the week, there may be more potential for a higher bill on a steep TOU rate plan</li> </ul>	<ul style="list-style-type: none"> <li>The risk of a higher bill is lower, but your ability to save money on your bill by shifting use off-peak is also lower.</li> <li>If you are typically home on afternoons during the week, a mild TOU rate plan can help limit the potential for a higher bill.</li> </ul>
--	--

*Prices per kWh are illustrative only.*

## OTHER COMPONENTS OF RATE PLANS

### Monthly Service Fees

- Typically based on the cost of providing certain services that all customers receive regardless of how much electricity they use, such as your connection to the grid, billing, customer service assistance, and communications.
- Other subscription-type services can have monthly fees, such cell phone plans, water service, etc.
- The price per kWh may be slightly lower than it would be on a rate structure without a monthly service fee.
- Can reduce your ability to save money by lowering or shifting your energy use, however, it can also help reduce your bills if you use a lot of energy.

### How it Works

For example, with a \$5 monthly service fee, you would pay \$5 whether you use no electricity during the month or a lot of electricity. The \$5 monthly service fee would be combined with your electricity per unit (kWh) charges.

- If your kWh charges were \$95, with a \$5 monthly service fee, your total charges would be \$100.
- If your kWh charges were \$0, your total charges would be \$5.

3.5 Which of the following services charges you a monthly service fee?

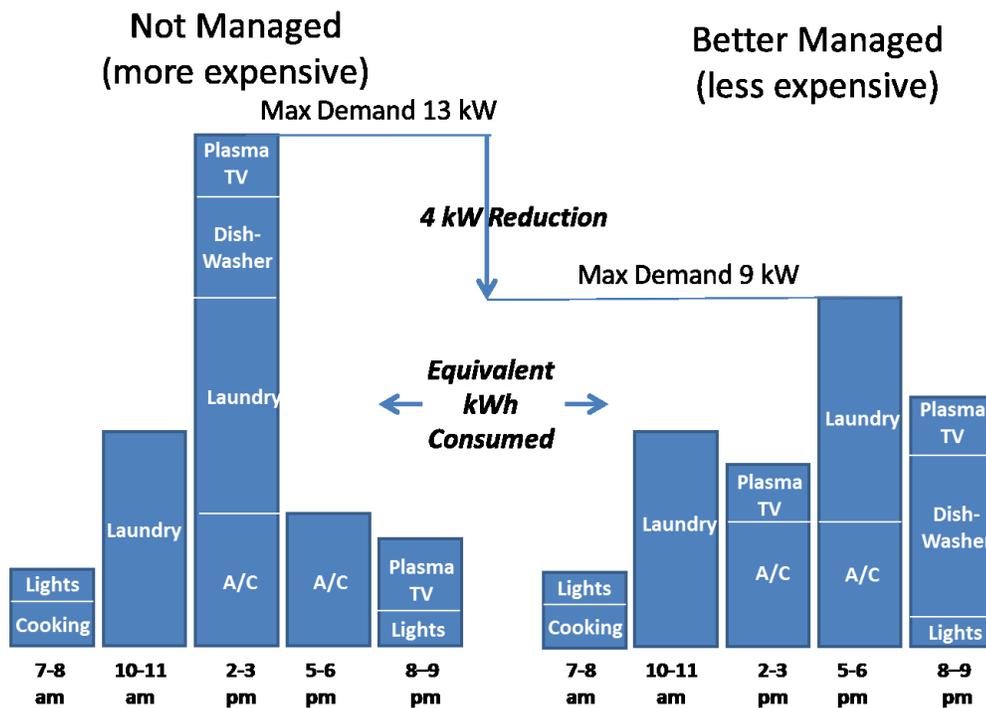
	Monthly Service Fee Included in Plan?			
	Yes	No	Not Sure	Don't Have
<b>Electricity</b>				
<b>Natural Gas</b>				

**DEMAND CHARGE <Substitute correct terminology for Riverside customers “reliability charge” >**

This is the last information section to read. Thank you for staying with us!

Electricity Demand – kilowatts (kW)

- Total demand for electricity by all customers can vary enormously according to time of day or time of year.
- For residential customers, kW demand is usually highest in the summer when air conditioners are running and in the winter when people come home and turn on their lights and use appliances and heaters.
- You can keep your demand low by spreading out your electricity (kWh) use as evenly as possible. For example, this chart shows how maximum demand can be lowered by spreading out activities such as laundry and dishwashing to other times of the day, while still using the same amount of electricity.



*Actual, relative and temporal demand per end-use is illustrative and will vary based on appliance model, when you are home, and other factors.*

Calculating Demand Charges

- Your maximum demand, or peak demand, will be the maximum kW used during any one hour period during the billing period when you run the most end-uses (appliances, lights, electronics, air conditioning, etc.) at the same time.
  - If you are able to spread out your demand evenly over the month and avoid high peaks, you will minimize your demand charge.

- If you are unable to avoid high peaks, you will have a higher demand charge.
- For example, if there is only one day during the billing period where you need to turn on your air conditioning, your demand charge will be based on your maximum demand during an hour when the air conditioning was running, which may be significantly higher than the maximum demand during any other hour during the billing period.

Examples of how your demand charge could be calculated:

Demand Charge \$ / kW	Max Demand	Billed Amount
\$2	10 kW	\$20
\$2	9 kW	\$18

3.6 Does a demand charge apply to your current electric bill?

SELECT ONE

Yes	
No	
Not sure	

3.7 If you were comparing electric rate plans, what would be the most important factors you would consider in choosing the plan for your household?

Please choose the three most important factors from the following:

RANDOMIZE ALL

<b>Understandable</b>	In language I can understand.	
<b>Simple</b>	Does not require a lot of effort to understand how my energy use behavior will affect my bill.	
<b>Stable</b>	Will not cause my bill to change a lot from month to month, or from season to season (winter / summer).	
<b>Predictable</b>	I know about how much my bill amount should be each month.	
<b>Worry-Free</b>	I don't need to pay attention to when during the day or month I use energy.	
<b>Saves Money</b>	Provides opportunity to save money on my bill by changing my energy use behavior.	
<b>Works for Me</b>	Fits my habits and lifestyle.	
<b>Green</b>	Helps protect our air and environment.	
<b>Fair</b>	Seems like a fair way to be charged for energy.	
<b>Reflects Cost of Electricity</b>	Encourages me to use less electricity during peak periods when it costs the most.	

**3.8. What does a fair way of being charged for energy mean to you?**

**OPEN ENDED QUESTION:**

## **Section 4**

### **Choice Exercise Introduction**

Now we're going to show you three different rate plans. These rate plan configurations are based on the material you've been reading about in our survey.

Note that these different rate plans are not rate increases, but merely different ways of billing you for electricity.

The rate plan configurations are going to be randomly generated. Some of the rate plan configurations will look similar to others you may have seen before, but they will all be different, even if they are only slight differences. Please pay attention to the differences between the rate plan configurations.

**<<12 Random, 1 Holdout (the same for each participant)>>**

Q 4.1 – Q 4.12

SHOW 1<sup>st</sup> RANDOMIZED CHOICE TASK.

Please carefully look at all three rate plans and pick the rate plan that you prefer the most.

SHOW 2<sup>nd</sup> RANDOMIZED CHOICE TASK.

Thank you! Here's another set of four rate plan configurations.

SHOW 3<sup>rd</sup> RANDOMIZED CHOICE TASK.

Now we're going to show you 10 more of these preference tasks.

Please carefully look at all four rate plans and pick the rate plan that you prefer the most.

REPEAT 11 Times

Q 4.13

SHOW HOLDOUT CHOICE TASK

Please carefully look at all three rate plans and pick the rate plan that you prefer the most.

Please tell us why you chose this option. Please be as specific as possible.

Q 4.14 If this electric rate plan were available today, how likely would you be to switch from your current electric rate plan?

<b>Would definitely switch</b>	
<b>Would consider switching</b>	
<b>No interest in switching</b>	
<b>Not sure</b>	

Q 4.15 Now we'd like to ask about how your choice of rate plan might be affected by the possibility that your bill might change. Different rate plans can have different consequences for individual customers.

Getting a lower bill by switching to a new rate plan may require you to change your energy use behavior. At the same time, if you do not change your energy use behavior, your bill might go up. Which combination of potential savings versus potential for a higher bill would you prefer if switching to a new rate plan?

If I switched to a new rate plan I would like the dollar amount of my bill to have the potential to:

- ...Stay the same. I am not willing to risk a higher bill for potential savings.
- ...Decrease by 5%, but increase no more than 5%
- ...Decrease by 10%, but increase no more than 10%
- ...Decrease by 15%, but increase no more than 15%
- ...Decrease by 20%, but increase no more than 20%
- ...Decrease by 25%, but increase no more than 25%

### **Section 5 – Try Before You Buy (TBYB)**

“Try Before You Buy” (TBYB) allows you to try out a new rate plan. If you end up saving money, you get to keep the savings. If you end up owing more money than you would have spent on your previous plan, then you get to pay only what you would have been charged on your previous plan.

5.1 Would your willingness to try each of these rate plans change with 12 months of “Try Before You Buy”?

	No TBYB Included		12 Months TBYB Included	
	Would Try	Would NOT Try	Would Try	Would NOT Try
<b>2 Tiered Rate</b>				
<b>3 Tiered Rate</b>				
<b>Flat Rate</b>				
<b>Steep TOU Rate</b>				
<b>Mild TOU Rate</b>				

**SECTION 6 DELETED DUE TO TIME CONSIDERATIONS**

**Section 7**

**BILL REVIEW HABITS AND BILL IMPACTS**

7.2 When you review your monthly **electric bill**, which of the following do you typically do? Select all that apply.

- Look at the amount due and/or the due date ..... 1
- Look at actual electricity or kWh use ..... 2
- Read the details about how your bill is calculated ..... 3
- Read notes or other messages that are on the bill ..... 4
- Read any inserts that are included with the bill..... 5
- None of these – you don't look at the bill ..... 6
- Not sure ..... 9

7.3 Thinking about the last year, what was your average monthly **electric bill** during last summer (May through October)?

\_\_\_\_(RECORD NUMBER 0-9999)

7.4 What was your average monthly **electric bill** during last winter (November through April)?

\_\_\_\_(RECORD NUMBER 0-9999)

7.5 When your **electric bill** is more than the average amount or what you were expecting, how much of an increase gets your attention?

<b>I look at my <b>electric bill</b> more closely when it is higher by approximately this \$ amount:</b>	
<b>\$0 to \$9</b>	
<b>\$10 to \$19</b>	
<b>\$20 to \$29</b>	
<b>\$30 to \$39</b>	
<b>\$40 to \$49</b>	
<b>\$50 to \$74</b>	
<b>\$75 to \$99</b>	
<b>More than \$100</b>	
<b>Not sure</b>	

7.6 How often in the past 12 months have you received an **electric bill** that was higher than expected?

Never	
Rarely (1-2 bills)	
Sometimes (3-4 bills)	
Often (more than 4 bills)	

**If Never, skip Questions 7.7 – 7.9**

7.7 Did you take action when you noticed a higher than expected bill?

Took Action	Called my <b>electric utility</b> company	
	Checked my usage online	
	Something else:	
I did not take action		
Can't recall		

**Section 8 – Demographics and Household Characteristics**

The remaining questions ensure that we are representing the opinions of all households.

D1 What is the last year of school you completed?

- Some high school or less ..... 1
- High school graduate..... 2
- Trade or technical school graduate ..... 3
- Undergraduate college degree ..... 4
- Masters or doctorate degree ..... 5
- Prefer not to answer ..... 9

D2 What is your current employment status?

- Employed full-time ..... 1
- Employed part-time ..... 2
- Unemployed or between jobs ..... 3
- Homemaker or caregiver (non-professional) ..... 4
- Student..... 5
- Retired..... 6
- Prefer not to answer ..... 9

D3	Do you spend any part of your work day at home?	
	Work at home all the time .....	1
	Work at home most of the time.....	2
	Work at home sometimes.....	3
	Do not work at home .....	4
D4	What do you consider your ethnicity to be?	
	White (but not Hispanic), .....	1
	African-American, .....	2
	Asian or Pacific Islander, .....	3
	Hispanic or Latin American.....	4
	Native American, .....	5
	Mixed race.....	6
	Something else (SPECIFY: _____) .....	98
	Prefer not to answer .....	99
D5	What languages do you speak in your home?	
	English .....	1
	Spanish .....	2
	Chinese - Mandarin .....	3
	Chinese - Cantonese.....	4
	Japanese.....	5
	Korean.....	6
	Filipino .....	7
	Hmong.....	8
	Vietnamese.....	9
	Something else (SPECIFY: _____) .....	10
	Prefer not to answer .....	98
D6	If you are willing to provide this information for demographic use only, we would like to know whether you or anyone in your household has a permanent disability, related to mobility, hearing, vision, cognitive, psychological, or chronic disease?	
	Yes.....	1
	No.....	2
	Prefer not to answer.....	9
D7	[IF D6=YES] In which category would you classify the disability?	
	Mobility.....	1
	Hearing.....	2
	Vision.....	3
	Cognitive (learning or mental).....	4

Psychological.....	5
Chronic disease.....	6
Other (Specify:____).....	7
Not sure / Prefer not to answer.....	9

H1 Which of the following best describes the type of home you live in?

Single family, detached (e.g., freestanding house).....	1
Single family attached such as town house or row house .....	2
Apartment or condo in multi-unit structure of 2–4 units .....	3
Apartment or condo in multi-unit structure of 5 or more units .	4
Mobile home .....	5
Not sure or prefer not to answer .....	8

H2 Do you or does your family own or rent your home?

Own .....	1
Rent.....	2

\*\*H3 Approximately in what year was your home built? Record the nearest decade if not known exactly.

\_\_\_\_\_ Record year (1800-2013)

H4 Are you enrolled on any of these special electric rate plans?

CARE or FERA (discount for low-income customers) (CA) ....	1
Low-income Discount (Non-CA) .....	2
Electric Vehicle rate plan .....	3
Time Of Use rate plan .....	4
Solar or Net Energy Metering (NEM) rate plan (CA).....	5
Solar Rate (non-CA) .....	6
SmartRate Plan (PG&E ONLY) .....	7
Balanced Payment Plan .....	8
Automatic Payment Service.....	9
None of these .....	10
Not sure .....	11

[IF NOT CHECKED IN H4]

H5 Do you plan to add the following in the next 12 months?

Plug-in Electric Vehicle .....	1
Solar Electricity.....	2
Not sure .....	3
No, I do not.....	4

<Insert 3.2 and 3.4 here for unexposed customers.>

H7    **OPTIONAL <Only include this question for SCE & PG&E customers>**

We have one last thing to ask you. Would you please provide the account number from your latest **electric bill**? Doing so is optional, however, it will help us better understand your answer to this survey. Your confidentiality will be maintained, and no sales call will result.

Yes, I will provide my account number

No, I prefer not to.

If yes

Please enter your account number here: \_\_\_\_\_

H8    **OPTIONAL**

What was your general impression of this survey?

Thank you for your participation.

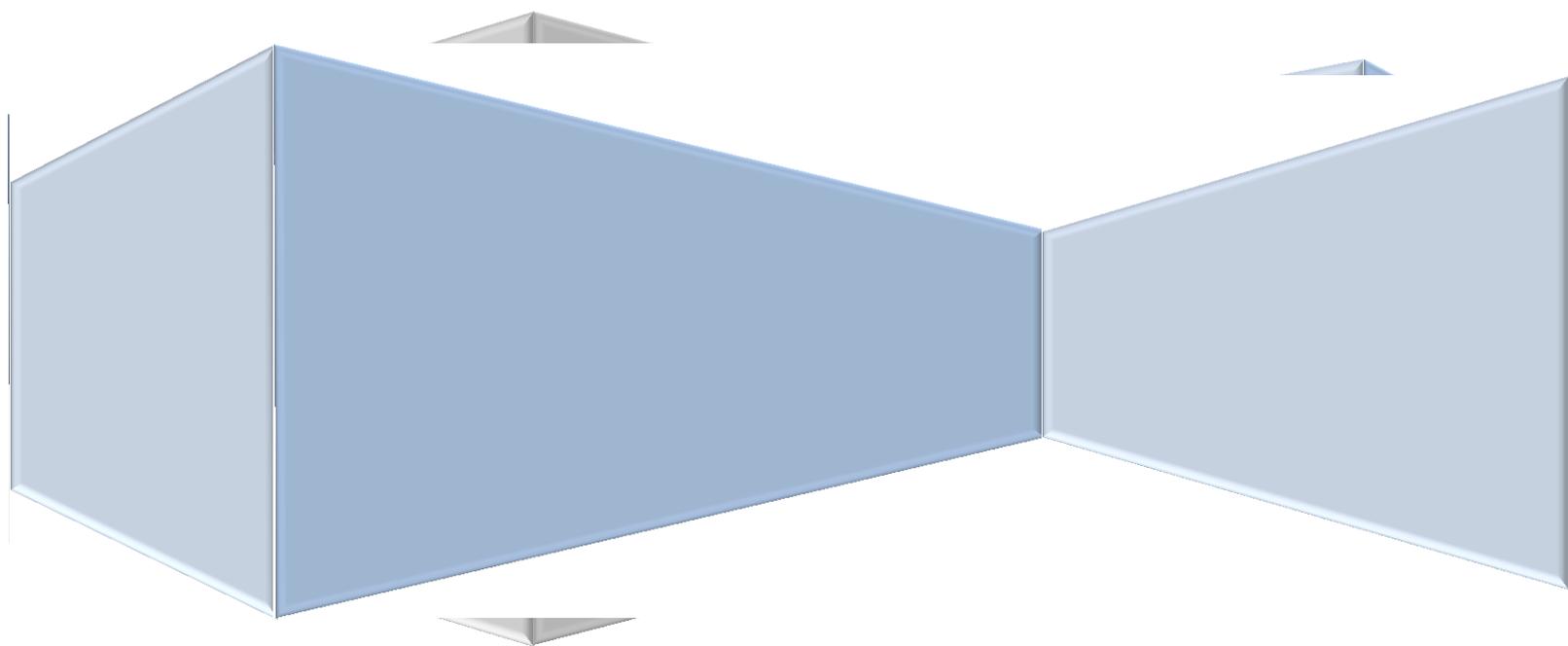
***PACIFIC GAS AND ELECTRIC COMPANY***  
***APPENDIX B***  
***BILL CALCULATOR USER MANUAL***

**Pacific Gas and Electric Company**

# **Residential Rate OIR Rate Design and Bill Impact Analysis Model**

**User Guide**

**Version 5.0    3/18/2013 FINAL**



# Table of Contents

Table of Contents .....	1
Overview .....	5
Methodology.....	5
Description of Inputs and Running Instructions .....	5
“Summary” Tab.....	5
.....	6
Rate Design Inputs (Non-TOU and TOU).....	6
• Current Rate Date .....	6
• 2 Tier Rate Ratio.....	6
• # of Tiers.....	6
• Baseline Allowance Percent .....	6
• Baseline Allowance from the Sample (Do not use the percent input) .....	7
• Tier-3 to Tier-4 Delta (cents/kWh).....	7
• Tier-4 to Tier-5 Delta (cents/kWh).....	7
• Tier 1 Increase (Over Current) .....	7
• Tier 2 Increase (Over Current) .....	7
• Minimum Charge imposed in lieu of Customer Charge.....	7
• Minimum Charge Applicable to Delivery Charge only .....	7
• Customer Charge (\$/Mo.) .....	7
• Fixed Charge Break Point (kW) .....	7
• Fixed Charge High Demand (\$/Mo.) .....	7
• Fixed Charge Low Demand (\$/Mo.) .....	7
• CARE Discount for Tier-1, Cust. Chg., Demand Chg. & Min. Bill Amt.....	8
• CARE Discount for Tier-2.....	8
• CARE Discount for Tier-3 and above .....	8
• Income Based Discount 100% of Poverty Level or Below.....	8
• Income Based Discount 100% to 200% of Poverty Level.....	8
• Income Based Discount 200% to300% of Poverty Level.....	8
• Frozen CARE T1/T2.....	8
• Use Existing CARE Tier-3 Rate .....	8

- Apply Income Based Discount Instead of Tier Based CARE Disc..... 8

Additional TOU Rate Design Specific Inputs ..... 8

- Number of TOU Periods..... 8
- TOU Rate Percentage Differential: On-Peak; Partial-Peak..... 8
- TOU Rate Percentage Differential: Partial-Peak, Off-Peak ..... 8
- TOU Baseline Credit in Cents per kWh..... 8
- Flat non-TOU Tier-1..... 9

Running Instructions ..... 9

- Step 1 – Update Baseline Quantity ..... 9
- Step 2 - Update Current Rate Bill ..... 9
- Step 3 – Update Cost Based Bill ..... 9
- Step 4 – Update Income Based Discount Calculation ..... 9
- Step 5 - Calculate TOU Rates..... 9
- Step 6 - Calculate Non-TOU Rates..... 9
- Step 5 - Update the Various Rate and Bill Impact Tables provided in the Tool to reflect Non-TOU rates ..... 9
- Step 6 - Update the Various Rate and Bill Impact Tables provided in the Tool to reflect TOU rates9

Rate Summary Tables ..... 10

- 1) Resulting Non-TOU Residential Rates..... 10
- 2) Resulting TOU Residential Rates ..... 10

Average Rate Impact Summary Tables ..... 11

- 1) Rate Impact Summary by Zone ..... 11
- 2) Rate Design Measure Table ..... 12

..... 12

Total Usage by Baseline Territory ..... 13

“Detailed Input” Tab ..... 13

Basic Inputs for Calculation tab ..... 13

- Percent Non-Residential Usage of the Total Usage Less CARE and Streetlights ..... 13
- Billions..... 13
- Minimum Charge (\$/month)..... 13
- Missing Income Replacement ..... 13
- Max Customer Monthly Ave Usage ..... 13

Number of hours per time period..... 13

PRISM Models Hours by Period .....	13
Tiered Rate for Energy Conservation Calculation (\$/kWh).....	13
Elasticity Input for non-TOU Energy Conservation Estimation .....	13
Elasticity Input for TOU Energy Conservation Estimation .....	13
Bill Impact Classification Percent.....	13
Percent of Sample Classification.....	14
Load Factor Range.....	14
Income Range .....	14
Current Rates Data.....	14
Inputs (Intermediate).....	14
• Basic inputs .....	14
• Non TOU Tier Collapsing Criteria .....	14
• Seasonal TOU Price Ratios .....	14
• Revenue Requirement Prior to Subsidy Allocation.....	14
• Generation Charge for “Minimum Bill on Delivery Charge Only” Calculation.....	14
• Fair Cost Rate Input (\$/kWh) .....	14
• Elasticity Based Usage Adjustment Factors .....	14
• Coincident Load Factor Averages.....	14
• Non-Coincident Load Factor Averages.....	14
• Time Of Use (TOU) kWh split by zone.....	14
• Average Usage Quantity (kWh per Day) by zone.....	14
• Medical Allowance Baseline Quantity (kWh per month).....	14
Tool Outputs .....	15
“PGE-Bill-Impact-Output-1” Tab .....	15
“PGE-Bill-Impact-Output-2” Tab .....	15
“PGE-Bill-Impact-Output-3” Tab .....	15
“PGE-Rate-Efficiency-Output” Tab.....	15
“PGE-Bill-And-Revenue-Study \$” Tab .....	16
“Correlation” Tab.....	16
“Cost-Based-Rate-Drivers” Tab.....	16
“Energy Conservation” Tab.....	17
Other Tabs.....	17

Definitions.....	18
<b>Appendix A1: “PG&amp;E Bill Impact-Output-1” Tab .....</b>	<b>19</b>
<b>Appendix A2: “Bill Impact Output-2” Tab .....</b>	<b>20</b>
<b>Appendix A3: “Bill Impact Output-3” Tab .....</b>	<b>21</b>
<b>Appendix B: “Rate-Efficiency-Output” Tab .....</b>	<b>22</b>
<b>Appendix C: “PGE-Bill-And-Revenue Study” Tab .....</b>	<b>23</b>
<b>Appendix D: “Correlation” Tab.....</b>	<b>24</b>
<b>Appendix E: “Cost-Based-Rate-Drivers” Tab.....</b>	<b>27</b>
<b>Appendix F: “Energy Conservation” Tab .....</b>	<b>28</b>
Customer Count by Federal Poverty Level.....	30
Changes Made to the Model since the Last Version (Dec 2012) .....	30
Changes Added in February 2013 Version.....	30
Changes Added in March 2013 (FINAL) Version .....	31

# Residential Rate OIR

## Rate Design and Bill Impact Analysis Model

### User Guide



## Overview

The Electric Bill Calculation Tool provides users with a tool that can be used to evaluate the residential rate and customer bill impacts of several rate structures when compared to rates set at **Cost-of-Service** levels. Specifically, the rate scenarios that may be evaluated in this tool includes:

- 1) Customer Charges (Single or **Split Demand-Based**)
- 2) Minimum Charges
- 3) Flat Rates
- 4) Tiered Rates (Two Tiers or Multiple Tiers)
- 5) TOU<sup>1</sup> Rates with Baseline Credits

Once rate scenarios have been run, several outputs are provided showing comparative rate and bill impacts as they relate to Cost-Based, **Current**, TOU and various non-TOU rates. Information is also provided showing: 1) correlations between Usage and Income for PG&E customers in several geographic areas; and 2) estimated energy consumption changes resulting from a move from an Inclining Block Rate design to a Flat Rate design and from a Flat Rate design to TOU rates.

## Methodology

### Description of Inputs and Running Instructions

**“Summary” Tab** – Manual inputs to the Tool are made in the Summary tab. The Summary tab also contains summary tables showing resulting residential rate impacts based on the inputs.

Inputs Field – The Inputs Field is used to make all manual inputs to the Tool. Inputs are made to set user-specified conditions for various residential rate scenarios (see Figure 1).

**Note:** The rate and bill impacts provided in this Tool will only utilize appropriate inputs. For example, if a single-tier (i.e. Flat) rate design is designated, any specified tier differentials will be ignored.

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<sup>1</sup> TOU – Time of Use

Step 2 Update Current Rate Bill	Step 3 Update Cost Based Bill
<b>Rate Design Inputs Non TOU and TOU</b>	
Step 5 Calculate Non TOU Rates	Current Rate Date => 7/1/2012
	2 Tier Rate Ratio => 20%
Step 6 Update Non TOU Reports	# of Tiers => 1
	Baseline Allowance Percent => 55%
	Baseline Allowance from the sample (Do not use the percent input) => No
	Step 1 Update Baseline Quantity
	Tier-3 to Tier-4 Delta (cents/kWh) => 3.00
	Tier-4 to Tier-5 Delta (cents/kWh) => 3.00
	T1 Increase (Over Current) => 0%
	T2 Increase (Over Current) => 0%
	Minimum Charge imposed in lieu of Customer Charge => No
	Minimum Charge Applicable to Delivery Charge Only => Yes
	Cust Charge \$/Mo. => 10.00
	Fixed Charge High Demand \$/Mo. => -
	Fixed Charge Low Demand \$/Mo. => -
	Fixed Charge Break Point kW => 3.00
	CARE Discount for Tier-1, Cust. Chg., Demand Chg. & Min. Bill Amt. => 25%
	CARE Discount for Tier-2 => 20%
	CARE Discount for Tier-3 and Above => 15%
	Income Based Discount 100% of Poverty Level or Below => 35%
	Income Based Discount 100% to 200% of Poverty Level => 25%
	Income Based Discount 200% to 300% of Poverty Level => 10%
Step 4 (Needed only if Income based discount is used) Update Income Based Discount	Frozen CARE T1/T2 => <input type="checkbox"/>
	Use existing CARE Tier-3 rate => <input type="checkbox"/>
	Apply Income Based Discount Instead of Tier Based CARE Disc => <input type="checkbox"/>
<b>Additional TOU Rate Design Specific Inputs</b>	
	Number of TOU Periods => 3
	TOU Rate Percent Differential: On-peak to Part-peak => 30%
	TOU Rate Pct. Differential: Part-peak to Offpeak (N/A if 2 TOU periods) => 30%
	TOU Base Line Credit in cents per kWh => 1.00
	Flat Non-TOU Tier-1 => No
Step 5 Calculate TOU Rates	
Step 6 Update TOU Reports	
Print Inputs and Reports	

Figure 1

### Rate Design Inputs (Non-TOU and TOU)

- **Current Rate Date** – The date on which Current Rates became effective.
- **2 Tier Rate Ratio** – The tier differential that will be applied to Tier-1 and Tier-2 rates in a two-tier rate design. For example, a 20 percent ratio would result in a Tier-2 rate that is 20 percent higher than the Tier-1 rate.
- **# of Tiers** – Dropdown box allows the user to choose a tiered rate design that incorporates from 1 up to 5 rate tiers.
- **Baseline Allowance Percent** – The percentage of residential electricity use that occurs at, or below, the baseline allowance amount (i.e., tier-one usage). Dropdown box allows

the user to choose from between 40 and 55 percent (the current baseline allowance percentage).

- ***Baseline Allowance from the Sample (Do not use the percent input)*** – Setting this to “Yes” will mean that the model will use the baseline quantity data from the sample. The percent input will be ignored by the model when designing rate any structure scenarios.
- ***Tier-3 to Tier-4 Delta (cents/kWh<sup>2</sup>)*** – The absolute cent-per-kWh differential that is applied to rate tiers 3 and 4 when the number of tiers specified in the “# of Tiers” dropdown box is greater than three.
- ***Tier-4 to Tier-5 Delta (cents/kWh<sup>3</sup>)*** – The absolute cent-per-kWh differential that is applied to rate tiers 4 and 5 when the number of tiers specified in the “# of Tiers” dropdown box is greater than three.
- ***Tier 1 Increase (Over Current)*** – The percentage by which to increase the current Tier-1 rate. This input is used when the number of tiers specified in the “# of Tiers” dropdown box is greater than two.
- ***Tier 2 Increase (Over Current)*** – The percentage by which to increase the current Tier-2 rate. This input is used when the number of tiers specified in the “# of Tiers” dropdown box is greater than two.
- ***Minimum Charge imposed in lieu of Customer Charge*** – Dropdown box allow the user to specify “Yes” or “No.” A minimum charge applied to any bill for monthly kWh usage up to a given level. For example, assume a minimum charge of \$4.00 and an electric rate of \$0.10 per kWh. A minimum charge of \$4.00 would be apply to any use up to 40 kWh (\$0.10 per kWh x 40 kWh = \$4.00). The per-kWh rate would apply directly to any use in excess of 40 kWh. For instance, assuming monthly use of 41 kWh, a customer would pay \$4.10 (\$0.10 per kWh x 41 kWh = \$4.10).

**Note:** When “Yes” is designated for a Minimum Charge, a Customer Charge will not apply.

- ***Minimum Charge Applicable to Delivery Charge only*** – Selecting “Yes” will be meaningful only if minimum charge is chosen in lieu of customer charge. In that case, generation charge will be excluded by the model when applying the minimum bill amount criteria.
- ***Customer Charge (\$/Mo.)*** – Fixed Monthly Customer Charge amount.
- ***Fixed Charge Break Point (kW)*** – The user-defined kW threshold at which a Fixed Monthly Customer Charge amount for high-demand customers will be applied. Customers with demand levels below the threshold will pay the Fixed Monthly Customer Charge amount for low-use customers. This input is utilized when a Split Demand-Based Customer Charge rate design is designated.
- ***Fixed Charge High Demand (\$/Mo.)*** – Fixed Monthly Customer Charge amount for high-use customers (used for a Split Demand-Based Customer Charge rate design).
- ***Fixed Charge Low Demand (\$/Mo.)*** – Fixed Monthly Customer Charge amount for low-use customers (used for a Split Demand-Based Customer Charge rate design).

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<sup>2</sup> Kilowatt Hour

<sup>3</sup> Kilowatt Hour

- ***CARE Discount for Tier-1, Cust. Chg., Demand Chg. & Min. Bill Amt.*** – The rate discount percentage applied to the Tier-1 usage rates, customer charge, minimum bill amount and fixed demand charge amount paid by customers qualifying for low income rate discounts.
- ***CARE Discount for Tier-2*** – The rate discount percentage applied to the Tier-2 usage rates paid by customers qualifying for low income rate discounts.
- ***CARE Discount for Tier-3 and above*** – The rate discount percentage applied to the Tier-3 and above usage rates paid by customers qualifying for low income rate discounts.
- ***Income Based Discount 100% of Poverty Level or Below*** – The rate discount is applied to the customer falling within the 100% of federal poverty level based on income.
- ***Income Based Discount 100% to 200% of Poverty Level*** – The rate discount is applied to the customer falling between the 100% and 200% of federal poverty level based on income.
- ***Income Based Discount 200% to 300% of Poverty Level*** – The rate discount is applied to the customer falling between the 200% and 300% of federal poverty level based on income.
- ***Frozen CARE<sup>4</sup> T1/T2*** – Click to put a check in the box. A checked box will freeze CARE Tier-1 and Tier-2 rates at their current levels.
- ***Use Existing CARE Tier-3 Rate*** - Click to put a check in the box. A checked box will freeze the CARE Tier-3 rate at its current level.
- ***Apply Income Based Discount Instead of Tier Based CARE Disc*** – Click to put a check in the box. A checked box will cause the model to set the tier-based CARE discount to zero internally, and use income based discount instead.

#### **Additional TOU Rate Design Specific Inputs**

- ***Number of TOU Periods*** – User can choose either two or three TOU periods. If three TOU period is chosen, then the TOU period is defined as on-peak, part-peak and off-peak based on PG&E's existing E-6 rate schedule. If two TOU period is chosen, then the model will treat the part-peak period and the off-peak period together as the off-peak period.
- ***TOU Rate Percentage Differential: On-Peak; Partial-Peak*** – The percentage rate differential that is applied to on-peak and part-peak rates. For example, assuming a 50 percent differential, the on-peak rate would be 50 percent higher than the part-peak rate.
- ***TOU Rate Percentage Differential: Partial-Peak, Off-Peak*** – The percentage rate differential that is applied to part-peak and off-peak rates.. For example, assuming a 40 percent differential, the part-peak rate would be 40 percent higher than the off-peak rate. If two TOU period based rate design is intended, then this ratio is set to 1 internally by the model.
- ***TOU Baseline Credit in Cents per kWh*** – A credit applied to bills calculated for customers utilizing TOU rates. The credit is applied on a per kWh basis for electric

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<sup>4</sup> CARE - California Alternative Rates for Energy

usage up to a customer's baseline allowance. For instance, assuming a monthly baseline allowance of 500 kWh, a customer with monthly use of 400 kWh would receive a credit equal to the specified per-kWh baseline credit times 400 kWh, a customer with monthly use of 500 kWh would receive a credit equal to the specified per-kWh baseline credit times 500 kWh, and a customer with use in excess of 500 kWh would receive a credit limited to the specified per-kWh baseline credit times 500 kWh.

- ***Flat non-TOU Tier-1*** – Selecting “Yes” will cause the model to design a flat non-TOU Tier-1 rate.

## Running Instructions

Once the necessary inputs have been made to run a given rate scenario, rate calculations are accomplished as follows:

***Step 1 - Update Baseline Quantity*** - Click on “Update Baseline Quantity” button located inside the Inputs area of the tab after updating the selection of baseline allowance (Baseline Allowance Percent or baseline quantity from the sample).

***Step 2 - Update Current Rate Bill*** – Click on “Update Current Rate Bill” button located above the Inputs area of the tab after selecting the current rate date, and updating the inputs in the “Detailed Inputs” tab.

***Step 3 - Update Cost Based Bill*** - Click on “Update Cost Based Bill” button located above the Inputs area of the tab after updating customer data in “Customer Data” tab, and the inputs in the “Detailed Inputs” tab.

***Step 4 - Update Income Based Discount Calculation*** - Click on “Update Income Based Discount Calculation” button located inside the Inputs area of the tab if “Apply Income Based Discount Instead of Tier Based CARE Disc” option is clicked.

***Step 5 - Calculate TOU Rates*** - Click on the “Calculate TOU Rates” button located in the Inputs area after providing the inputs in this (“Summary”) tab.

***Step 6 - Calculate Non-TOU Rates*** – Click on the “Calculate Non-TOU Rates” button located in the Inputs area after providing the inputs in this (“Summary”) tab..

***Step 5 - Update the Various Rate and Bill Impact Tables provided in the Tool to reflect Non-TOU rates*** – Click on the “Update Non-TOU Reports” button located in the Inputs area of the tab.

***Step 6 - Update the Various Rate and Bill Impact Tables provided in the Tool to reflect TOU rates*** – Click on the “Update TOU Reports” button located in the Inputs area of the tab.



- On-Peak
- Partial-Peak
- Off Peak
- Customer Charge
- Split Demand-Based Customer Charge

Resulting TOU Rate				
Non-CARE		Forecast Period Sales (GWh)	% of Sales	Rate
Tier-1	Summer On-Peak	1.31	6.0%	15.8
	Summer Part-Peak	1.40	7.0%	15.8
	Summer Off-Peak	3.62	17.0%	15.8
	Winter Part-Peak	0.79	4.0%	15.8
	Winter Off-Peak	5.82	27.0%	15.8
	Tier-2	Summer On-Peak	0.92	4.0%
	Summer Part-Peak	0.94	4.0%	20.1
	Summer Off-Peak	2.36	11.0%	16.8
	Winter Part-Peak	0.49	2.0%	16.1
	Winter Off-Peak	3.71	18%	16.8
	Cust \$/Mo.			5.0
	Fixed Charge High Demand \$/Mo.			0.0
	Fixed Charge Low Demand \$/Mo.			0.0
	Min Charge \$/Mo.			0.0
CARE		Forecast Period Sales (GWh)	% of Sales	Rate
Tier-1	Summer On-Peak	0.60	8%	11.8
	Summer Part-Peak	0.59	7%	11.8
	Summer Off-Peak	1.47	19%	11.8
	Winter Part-Peak	0.31	4%	11.8
	Winter Off-Peak	2.34	30%	11.8
Tier-2	Summer On-Peak	0.32	4%	20.9
	Summer Part-Peak	0.31	4%	16.1
	Summer Off-Peak	0.75	10%	13.4
	Winter Part-Peak	0.13	2%	12.9
	Winter Off-Peak	1.03	12%	13.4
	Cust \$/Mo.			3.8
	Fixed Charge High Demand \$/Mo.			0.0
	Fixed Charge Low Demand \$/Mo.			0.0
	Min Charge \$/Mo.			0.0

Figure 3

### Average Rate Impact Summary Tables

A summary table is provided in the “Summary” tab showing: 1) Average Rate Impact Summaries by Zone; and 2) Rate Design Measures (see Figure 4)

#### 1) *Rate Impact Summary by Zone*

Information includes:

- Non-CARE and CARE average system-wide and baseline territory average rate impacts
  - **Cost-Based Rates**
  - Current Rates
  - Proposed Non-TOU Rates
  - Proposed TOU Rates

2) **Rate Design Measure Table** – The Rate Design Measures Table provides the following information as it relates to Current Rates, Non-TOU Rates and TOU Rates (see Figure 5):

- Residential CARE Subsidy (M\$)
- Non-Residential Estimated CARE Subsidy (M\$)
- Effective CARE Discount Percentage
- Percentage of Fixed Cost Recovery<sup>5</sup>
- Percent Fixed Cost Not Recovered<sup>6</sup>

Average Rate Impact Summary (Cents / kWh) by Zone						
NON-CARE						
Baseline Region	Cost Based Rate	Jul-12 Rate	Proposed Non-TOU 3-Tier Rate	Proposed TOU Rate		
Q	14.8	17.2	17.3	17.5		
T	16.8	18.2	18.2	17.9		
V	16.6	16.5	15.8	17.3		
X	17.0	18.0	17.7	17.6		
S	17.5	18.1	17.7	17.6		
P	16.7	16.5	16.5	17.3		
R	17.3	18.1	17.5	17.6		
W	18.3	17.8	17.4	17.7		
Y	15.7	15.6	15.9	17.4		
Z	21.2	14.2	16.7	17.8		
<b>Non-CARE Customers</b>	<b>17.1</b>	<b>18.0</b>	<b>17.7</b>	<b>17.6</b>		
CARE						
Baseline Region	Cost Base Rate	Jul-12 Rate	Proposed Non-TOU 3-Tier Rate	Proposed TOU Rate		
Q	N/A	N/A	N/A	N/A		
T	16.4	9.4	13.8	13.7		
V	18.4	9.1	13.0	13.6		
X	17.3	9.1	13.0	13.4		
S	17.7	9.6	13.9	13.5		
P	15.8	9.1	12.6	13.2		
R	17.6	9.3	13.1	13.4		
W	17.1	9.4	13.2	13.5		
Y	15.5	8.7	11.3	13.0		
Z	N/A	N/A	N/A	N/A		
<b>CARE Customers</b>	<b>17.1</b>	<b>9.3</b>	<b>13.3</b>	<b>13.5</b>		
Rate Design Measures	Current Rate Levels	Non-TOU 3-Tier Rate	TOU			
Residential CARE Subsidy (\$M) =>	\$ 627,003,686	\$ 276,000,000	\$ 259,000,000			
Residential CARE subsidy funded by non-residential class (\$M) =>	\$ 438,902,580	\$ 193,200,000	\$ 181,300,000			
Effective CARE Discount % =>	48%	20%	18%			
Percent of Revenue Requirement met by Fixed Customer Charge =>	0%	5%	5%			
Percent Fixed Cost Not Recovered	24%	19%	19%			

Figure 4

<sup>5</sup> The percentage of total fixed costs that are recovered through a given level of fixed charges.

<sup>6</sup> This represents the percentage of total costs that are NOT collected through fixed charges. In the example shown in Figure 4, no costs are collected through fixed charges. Accordingly, one can conclude that 22 percent of total costs are fixed costs. If all fixed costs (i.e., 22 percent of total costs) were collected through a fixed charge(s), the "Fixed Cost Recovery Deviation from Cost" would be 0 percent.

There are two additional Rate Design Measure table similar to the Figure 4 table, that can be used to show the non-TOU and TOU rate impacts separately.

### **Total Usage by Baseline Territory**

A summary table is provided in the “Summary” tab showing total usage (GWh) for non-CARE and CARE customers by PG&E baseline territory.

**“Detailed Input” Tab** – Various inputs that may be needed for rate design are provided by the user in this tab.

#### **Basic Inputs for Calculation tab**

- ***Percent Non-Residential Usage of the Total Usage Less CARE and Streetlights*** – This is normally 70% for PG&E.
- ***Billions***– This is used as a common billion divisor or multiplier as necessary in the model.
- ***Minimum Charge (\$/month)***– The minimum monthly charge will be used by the model if “Minimum Charge in Lieu of Customer Charge” option is chosen in the “Summary” tab..
- ***Missing Income Replacement*** – User can choose the replacement of annual income for the model to estimate bill to income ratio when this data is missing.
- ***Max Customer Monthly Ave Usage*** – This is normally 2000 for PG&E customers.

#### **Number of hours per time period**

These inputs are used in the “Energy conservation” tab.

#### **PRISM Models Hours by Period**

These inputs are used in the “Energy conservation” tab.

#### **Tiered Rate for Energy Conservation Calculation (\$/kWh)**

These inputs are used in the “Energy conservation” tab to calculate estimate energy conservation.

#### **Elasticity Input for non-TOU Energy Conservation Estimation**

These inputs are used in the “Energy conservation” tab.

#### **Elasticity Input for TOU Energy Conservation Estimation**

These inputs are used in the “Energy conservation” tab.

#### **Bill Impact Classification Percent**

These bill impact range inputs are used in the “PGE Bill Impact Output-1” tab to report the results in a desired level of granularity. It is also used in the “PGE Bill Impact Output-2” tab.

## Percent of Sample Classification

These ranges are used in the “PGE Bill Impact Output-1” tab to report the results in a desired level of reporting granularity.

## Load Factor Range

These load factor range inputs are used in the “PGE-Bill-Impact-Output-3” tab to report the bill impact results at a desired level of load factor ranges.

## Income Range

These range inputs are used in the “PGE-Bill-Impact-Output-3” tab to report the bill impact results at a desired level of income ranges.

## Current Rates Data

These inputs are based on the respective advice letters and are used by the model to determine current rate based bill amount, and the revenue collection by various rate design scenarios. The naming of these inputs are intended to explain what these are.

## Inputs (Intermediate)

- **Basic inputs** – These inputs require updating based on the sample data used in this model.
- **Non TOU Tier Collapsing Criteria** – These inputs are used in defining how the tiers would be collapsed when designing a two, three or a four tiered rate structure.
- **Seasonal TOU Price Ratios**– User can change these ratios to get a desired level of seasonal price differentiation.
- **Revenue Requirement Prior to Subsidy Allocation** – If calibration to current rate based revenue collection is desired then these inputs should be driven by respective data from “Revenue Summary” tab. Alternatively, the user can choose a different set of inputs. However, the resulting rates will not be comparable to the current rates in that case.
- **Generation Charge for “Minimum Bill on Delivery Charge Only” Calculation** – These inputs are used as estimates of the generation charge that should be outside the minimum charge when such option is chosen.
- **Fair Cost Rate Input (\$/kWh)** – These inputs are used for cost based bill amount calculation. The naming for these inputs are intended for explaining what these are.
- **Elasticity Based Usage Adjustment Factors** – The usage (kWh) adjustment factors can be provided as inputs for non-TOU and TOU rate designs in two tables.
- **Coincident Load Factor Averages** – These inputs are used to replace missing values.
- **Non-Coincident Load Factor Averages** – These inputs are used to replace missing values.
- **Time Of Use (TOU) kWh split by zone** – These inputs are used to replace missing values.
- **Average Usage Quantity (kWh per Day) by zone** – These inputs are used to calculate baseline quantity based on baseline percent chosen by the user.
- **Medical Allowance Baseline Quantity (kWh per month)** – This input is used to calculate baseline quantity based on baseline percent chosen by the user.

## Tool Outputs

**“PGE-Bill-Impact-Output-1” Tab** – Bill impact information is provided in tabular and graphic form in this tab. The information is segmented based on levels of percentage bill impacts that will be experienced by customers. A dropdown box is used to show bill impacts specific to Non-CARE, CARE or All Customers (see Appendix A).

Data Source: 2009 RASS sample merged with 2011 recorded usage.

The information provided in the bill impact tables includes:

- Bill Percentage Change Groups
- Number of Customers in Each Group
- Percentage of Customers in Each Group
- Average Monthly Kwh Use of Customers in Each Group
- Average Load Factor of Customers in Each Group
- Average “On-Peak” Percentage of Customers in Each Group
- Average Current Rates for Customers in Each Group
- Average Proposed Rates for Customers in Each Group
- Average Percentage Rate Change for Customers in Each Group
- Average Current Bills for Customers in Each Group
- Average Proposed Bills for Customers in Each Group
- Average Bill Change for Customers in Each Group

**“PGE-Bill-Impact-Output-2” Tab** – Bill impact information is provided in tabular form in this tab. The information is segmented based on levels of percentage bill impacts and dollar bill impacts that will be experienced by customers.

**“PGE-Bill-Impact-Output-3” Tab** – This tab shows the bill impacts by load factor ranges and income ranges.

**“PGE-Rate-Efficiency-Output” Tab** – This tab shows various rates and percentage rate changes from Current Rates (see Appendix B). The information is presented in tabular and graphic form based on average kWh usage levels.

The information shown in the rate tables includes:

- Average Monthly Usage-Level Categories
- Average Cost-Based Rate by Usage Level
- Average Current Rates by Usage Level
- Average Non-TOU Rate by Usage Level
- Average TOU Rate by Usage Level
- Cost-Based Rate Percentage Change from Current Rates
- Proposed Non-TOU Rate Percentage Change from Current Rates

- Proposed TOU Rate Percentage Change from Current Rates

**“PGE-Bill-And-Revenue-Study \$” Tab** – This tab shows the difference in monthly average bills and annual revenue recovery when cost of service is compared to current and optional rate designs (see Appendix C). The information is segmented based on average kWh usage levels.

The information shown in the tables in this tab includes:

- Average Monthly Usage-Level Categories
  - Cost-Based Rates
  - Current Rates
  - Non-TOU Rates
  - TOU Rates
  - Current, Non-TOU and TOU Average Monthly Bill Differences when Compared to Cost-Based Rates
- Total Annual Revenue by Average Monthly Usage Levels
  - Cost-Based Rates
  - Current Rates
  - Non-TOU Rates
  - TOU Rates
  - Current, Non-TOU and TOU Total Annual Revenue Differences when Compared to Cost-Based Rates

**“Correlation” Tab** – This tab includes instructive content related to the correlation between usage and income (see Appendix D).

The information provided in the tab includes:

- Chart Showing Correlation Between Usage and Income for: 1) All Customer; 2) Non-CARE Customers; and 3) CARE Customers in Several Geographic Areas
  - Coast
  - Hills
  - Inner Valley
  - Outer Valley
  - PG&E Service Territory
- Scatter Graphs Showing
  - Correlation = 0 (No Correlation)
  - Correlation = 1 (Full Correlation)
  - Correlation - .23 (Low Correlation)
  - Income Vs. Usage for Non-CARE and Care Households
  - Subsidization by Lower Income Customers Due to Low Correlations
- Tables showing Income versus Usage levels for Non-CARE and CARE Customers
- Tables showing subsidization resulting from lack of correlation

**“Cost-Based-Rate-Drivers” Tab** – This tab shows the major Electric Rate cost components along with their cost-based allocations (see Appendix E).

The information provided in the tab includes:

- Cost Components
  - Generation Energy Charges by Season and Peak Period (i.e., On-Peak, Partial-Peak, Off-Peak)
  - Generation Capacity Cost
  - Transmission Capacity Cost
  - Primary/Secondary Distribution Capacity Costs
  - Customer Access Charge
  - Other Fixed Charges
- Marginal Cost of each Component
- Allocation Methodology for each Component
- Graphic Depiction of Annual Generation and Transmission Capacity Cost Profiles

**“Energy Conservation” Tab** – This tab shows estimated consumptions changes when moving from one rate design to another (see Appendix F).

The information provided in the tab includes:

- Tables Showing Estimated Annual KWh Consumption Changes for Non-CARE and CARE Customers When Moving from:
  - Current (Inclining Block) Rates to Flat Rates
  - Flat Rates to TOU Rates

**Other Tabs** – There are several other tabs in this model as described below.

- Calculation tabs: There are eight calculation tabs in this model used for rate design and reporting calculations. Users are not supposed to make any changes in these tabs.
- Input Intermediate tab: This tab is hidden and is used by the model to preprocess the input data
- Load Factor Summary: The load factor summary tab contains data that are used for missing value replacement. These data were generated using a SAS program. User can choose to either use these values, or use other appropriate missing values by providing those in the “Detailed Input” tab.
- Revenue Summary: This tab has Advice Letter specific data corresponding to the current rate dates provided in the “Detailed Input” tab.

## Definitions

**Cost-Based Rates** – Rates based on costs that are largely consistent with 2011 General Rate Case (GRC) data. The **revenue requirement** used in calculating rates is consistent with 1011 GRC Phase-II submission, adjusted for the 2009 RASS sample merged with 2011 usage data.

**Cost of Service** – Customer class cost of service allocation that is aligned with marginal cost allocation principles.

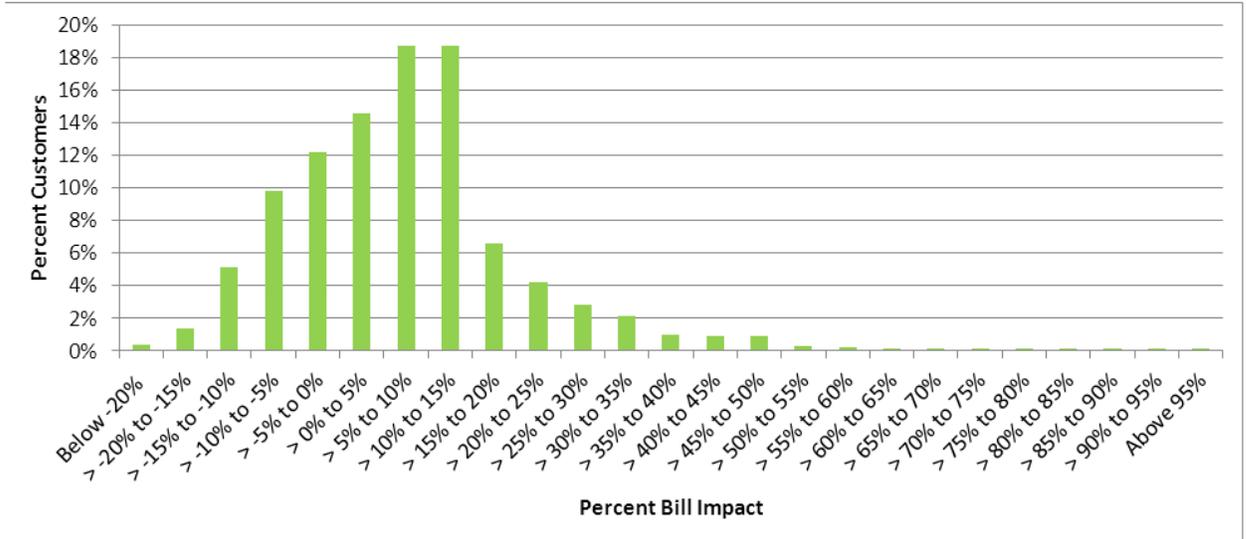
**Current Rates** – Currently effective residential rate designs and/or rate levels.

**Split Demand-Based Customer Charges** – Fixed monthly customer charges that vary depending on customers' levels of electric (kW) demand.

## Appendix A1: "PG&E Bill Impact-Output-1" Tab

NonCARE Customers ▼  
 Press F9 to update charts and tables after selection.

### Non TOU 3-Tier Rate Design Impacts NonCARE Customers



### Non TOU 3-Tier Rate Design Impacts NonCARE Customers

Impact	Customer		Average		Average Cents/kWh			Monthly \$			Average Bill to Income Ratio	
	Number	Percent	Monthly - kWh	Load Factor	Jul-12	Proposed	Change	Jul-12	Proposed	Change	Jul-12	Proposed
Below -20%	11,411	0%	565	20%	23.04	17.34	-25%	130.11	97.93	(32.18)	2.2%	1.6%
> -20% to -15%	44,854	1%	1,861	19%	28.27	23.26	-18%	526.05	432.88	(93.18)	4.4%	3.6%
> -15% to -10%	172,210	5%	1,139	17%	23.90	20.97	-12%	272.12	238.72	(33.40)	2.9%	2.6%
> -10% to -5%	327,422	10%	871	16%	21.25	19.65	-8%	185.18	171.17	(14.01)	2.2%	2.1%
> -5% to 0%	407,567	12%	755	15%	18.25	17.80	-2%	137.80	134.42	(3.37)	1.8%	1.7%
> 0% to 5%	487,970	15%	608	14%	16.19	16.59	2%	98.37	100.77	2.39	1.2%	1.2%
> 5% to 10%	627,612	19%	454	13%	14.29	15.36	7%	64.85	69.67	4.82	0.8%	0.9%
> 10% to 15%	627,873	19%	335	12%	13.17	14.74	12%	44.07	49.32	5.26	0.7%	0.8%
> 15% to 20%	221,243	7%	229	10%	13.10	15.33	17%	30.01	35.13	5.11	0.5%	0.5%
> 20% to 25%	139,640	4%	173	11%	13.03	15.93	22%	22.52	27.52	5.00	0.4%	0.5%
> 25% to 30%	94,096	3%	142	10%	12.98	16.48	27%	18.40	23.35	4.95	0.3%	0.4%
> 30% to 35%	71,916	2%	119	10%	13.09	17.39	33%	15.63	20.77	5.14	0.2%	0.3%
> 35% to 40%	31,337	1%	81	9%	13.79	19.04	38%	11.17	15.41	4.25	0.2%	0.3%
> 40% to 45%	29,811	1%	64	8%	14.81	21.08	42%	9.43	13.43	4.00	0.2%	0.2%
> 45% to 50%	29,791	1%	197	10%	13.02	19.10	47%	25.68	37.68	12.00	0.5%	0.7%
> 50% to 55%	8,575	0%	70	11%	13.21	20.03	52%	9.19	13.94	4.75	0.1%	0.2%
> 55% to 60%	6,315	0%	65	12%	13.12	20.52	56%	8.55	13.37	4.82	0.1%	0.2%
> 60% to 65%	2,244	0%	53	8%	13.81	22.36	62%	7.26	11.75	4.49	0.1%	0.1%
> 65% to 70%	2,442	0%	41	13%	14.96	25.01	67%	6.15	10.28	4.13	0.1%	0.2%
> 70% to 75%	2,903	0%	48	9%	13.51	23.25	72%	6.49	11.17	4.68	0.1%	0.1%
> 75% to 80%	2,095	0%	50	10%	12.97	22.78	76%	6.52	11.46	4.94	0.1%	0.2%
> 80% to 85%	1,048	0%	26	20%	17.49	32.27	85%	4.50	8.31	3.81	0.2%	0.4%
> 85% to 90%	433	0%	40	9%	13.65	25.35	86%	5.46	10.14	4.68	0.1%	0.1%
> 90% to 95%	1,121	0%	34	8%	14.38	27.43	91%	4.93	9.40	4.47	0.1%	0.1%
Above 95%	1,622	0%	37	20%	13.16	26.42	101%	4.85	9.73	4.88	0.1%	0.2%
<b>Group Total</b>	<b>3,353,549</b>	<b>100%</b>	<b>530</b>	<b>13%</b>	<b>17.95</b>	<b>17.65</b>	<b>-2%</b>	<b>95.23</b>	<b>93.63</b>	<b>(1.60)</b>	<b>1.3%</b>	<b>1.3%</b>

Similar to the non-TOU rate impact shown above, this tab has TOU rate impact results as well.



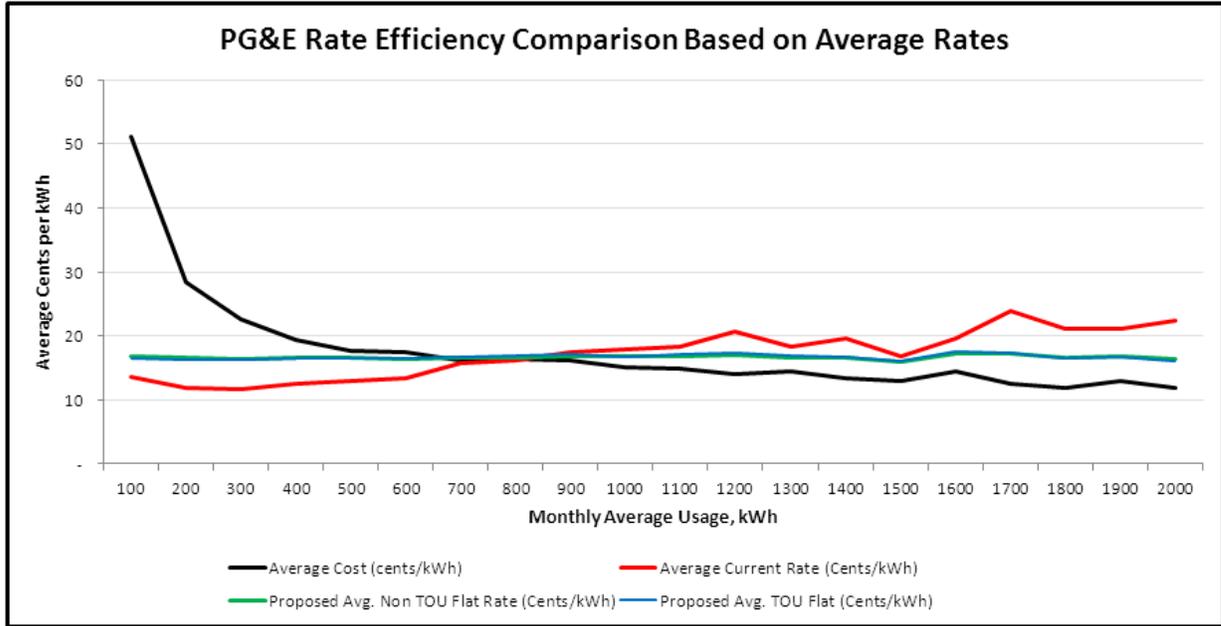
## Appendix A3: "Bill Impact Output-3" Tab

PG&E Bill Impact Tables by Load Factor and Income Ranges								
Load Factor Description	Load Factor Range	Avg. Percent Non TOU Bill Impact	Avg. Current Bill	Avg. Non TOU Bill	Avg. Cost Based Bill	Avg. Percent TOU Bill Impact	Avg. TOU Bill	Number of Households
<b>Non CARE</b>								
Low	0 to 25%	-8%	95.05	87.10	90.88	-7%	88.27	3,276,526
Medium	25% to 40%	-28%	179.28	129.52	101.73	-27%	131.43	70,879
High	Above 40%	44%	28.24	40.53	36.48	42%	39.97	6,144
<b>Non CARE Average</b>		<b>-9%</b>	<b>96.71</b>	<b>87.91</b>	<b>91.01</b>	<b>-8%</b>	<b>89.10</b>	<b>3,353,549</b>
<b>CARE</b>								
Low	0 to 25%	51%	46.79	70.52	87.47	53%	71.77	1,202,126
Medium	25% to 40%	37%	76.95	105.56	100.22	41%	108.30	63,527
High	Above 40%	41%	53.60	75.84	68.05	42%	76.16	2,378
<b>CARE Average</b>		<b>50%</b>	<b>48.31</b>	<b>72.29</b>	<b>88.07</b>	<b>52%</b>	<b>73.61</b>	<b>1,268,031</b>
<b>All Customers</b>								
Low	0 to 25%	1%	82.10	82.65	89.96	2%	83.84	4,478,652
Medium	25% to 40%	-10%	130.91	118.19	101.02	-8%	120.50	134,406
High	Above 40%	43%	35.31	50.38	45.29	42%	50.07	8,522
<b>All Customers Average</b>		<b>0%</b>	<b>83.43</b>	<b>83.62</b>	<b>90.20</b>	<b>2%</b>	<b>84.85</b>	<b>4,621,580</b>

Income Range	Avg. Percent Non TOU Bill Impact	Avg. Current Bill	Avg. Non TOU Bill	Avg. Cost Based Bill	Avg. Percent TOU Bill Impact	Avg. TOU Bill	Number of Households
<b>Non CARE</b>							
0 to 30K	-23%	66.53	51.54	74.87	-22%	52.23	351,895
30K to 60K	-2%	74.39	73.27	81.48	-1%	74.02	875,392
60K to 75K	-4%	97.32	93.33	96.61	-2%	95.02	464,643
75K to 100K	-5%	95.58	91.17	90.73	-3%	92.40	596,618
100K to 500K	-14%	125.39	107.77	101.88	-13%	109.24	1,065,002
<b>Non CARE Average</b>		<b>-9%</b>	<b>96.71</b>	<b>87.91</b>	<b>-8%</b>	<b>89.10</b>	<b>3,353,549</b>
<b>CARE</b>							
0 to 30K	38%	40.48	55.68	78.96	39%	56.42	694,134
30K to 60K	55%	53.20	82.64	94.19	58%	84.19	404,439
60K to 75K	64%	73.10	120.22	113.89	70%	124.10	62,731
75K to 100K	78%	55.78	99.46	98.05	82%	101.31	67,939
100K to 500K	62%	84.48	136.47	128.23	67%	140.73	38,788
<b>CARE Average</b>		<b>50%</b>	<b>48.31</b>	<b>72.29</b>	<b>52%</b>	<b>73.61</b>	<b>1,268,031</b>
<b>All Customers</b>							
0 to 30K	10%	49.24	54.29	77.58	12%	55.01	1,046,029
30K to 60K	13%	67.70	76.23	85.50	14%	77.23	1,279,831
60K to 75K	2%	94.44	96.53	98.66	4%	98.48	527,374
75K to 100K	1%	91.51	92.02	91.48	2%	93.31	664,557
100K to 500K	-12%	123.95	108.78	102.81	-11%	110.35	1,103,790
<b>All Customers Average</b>		<b>0%</b>	<b>83.43</b>	<b>83.62</b>	<b>2%</b>	<b>84.85</b>	<b>4,621,580</b>

## Appendix B: “Rate-Efficiency-Output” Tab



Cost of Service vs. Current and Proposed Rate Designs							
Average Monthly Usage	Average Cost (cents/kWh)	Average Current Rate (Cents/kWh)	Proposed Avg. Non TOU Flat Rate (Cents/kWh)	Proposed Avg. TOU Flat (Cents/kWh)	Percent Change-Current	Percent Change-Proposed Non TOU Flat Rate	Percent Change-Proposed TOU
100	51.15	13.71	16.76	16.51	-73%	-67%	-68%
200	28.45	11.97	16.71	16.37	-58%	-41%	-42%
300	22.51	11.64	16.38	16.21	-48%	-27%	-28%
400	19.50	12.44	16.66	16.45	-36%	-15%	-16%
500	17.69	12.95	16.52	16.44	-27%	-7%	-7%
600	17.38	13.48	16.36	16.49	-22%	-6%	-5%
700	16.16	15.67	16.67	16.75	-3%	3%	4%
800	16.41	16.19	16.65	16.87	-1%	2%	3%
900	16.09	17.51	16.87	17.09	9%	5%	6%
1000	15.04	17.85	16.72	16.80	19%	11%	12%
1100	14.93	18.43	16.83	17.10	23%	13%	15%
1200	13.96	20.62	17.12	17.27	48%	23%	24%
1300	14.39	18.35	16.63	16.89	28%	16%	17%
1400	13.39	19.52	16.66	16.64	46%	24%	24%
1500	13.07	16.80	15.94	16.01	29%	22%	23%
1600	14.50	19.71	17.16	17.59	36%	18%	21%
1700	12.62	23.82	17.23	17.25	89%	37%	37%
1800	11.87	21.20	16.52	16.49	79%	39%	39%
1900	13.00	21.14	16.81	16.74	63%	29%	29%
2000	11.94	22.41	16.35	16.05	88%	37%	34%

There are separate charts for non-TOU and TOU rate designs as well in this tab.

## Appendix C: "PGE-Bill-And-Revenue Study" Tab

Cost of Service vs. Current and Proposed Rate Designs							
Monthly Average Bill					Difference from Cost		
Average Monthly Usage	Average Cost	Average Current	Average Non TOU Flat Rate	Average TOU	Current	Non TOU Flat Rate	TOU
100	\$32.47	\$8.70	\$10.64	\$10.48	(\$23.77)	(\$21.83)	(\$21.99)
200	\$43.83	\$18.43	\$25.74	\$25.22	(\$25.39)	(\$18.09)	(\$18.60)
300	\$56.22	\$29.06	\$40.90	\$40.48	(\$27.15)	(\$15.31)	(\$15.74)
400	\$68.30	\$43.58	\$58.34	\$57.60	(\$24.72)	(\$9.96)	(\$10.70)
500	\$78.43	\$57.40	\$73.24	\$72.86	(\$21.03)	(\$5.19)	(\$5.57)
600	\$95.17	\$73.81	\$89.57	\$90.29	(\$21.36)	(\$5.60)	(\$4.88)
700	\$104.55	\$101.37	\$107.81	\$108.37	(\$3.19)	\$3.26	\$3.81
800	\$122.66	\$121.08	\$124.52	\$126.15	(\$1.58)	\$1.86	\$3.48
900	\$136.17	\$148.18	\$142.75	\$144.62	\$12.01	\$6.58	\$8.45
1000	\$143.40	\$170.17	\$159.33	\$160.15	\$26.77	\$15.93	\$16.75
1100	\$155.90	\$192.38	\$175.76	\$178.56	\$36.48	\$19.86	\$22.66
1200	\$159.39	\$235.48	\$195.48	\$197.23	\$76.09	\$36.10	\$37.85
1300	\$180.29	\$229.99	\$208.35	\$211.69	\$49.70	\$28.06	\$31.40
1400	\$179.85	\$262.20	\$223.78	\$223.41	\$82.35	\$43.92	\$43.56
1500	\$190.28	\$244.56	\$231.99	\$233.11	\$54.28	\$41.71	\$42.83
1600	\$221.55	\$301.19	\$262.32	\$268.79	\$79.64	\$40.77	\$47.24
1700	\$205.52	\$387.96	\$280.65	\$280.96	\$182.44	\$75.13	\$75.44
1800	\$207.12	\$369.98	\$288.18	\$287.70	\$162.86	\$81.06	\$80.59
1900	\$240.22	\$390.46	\$310.53	\$309.26	\$150.25	\$70.31	\$69.04
2000	\$294.90	\$553.58	\$403.96	\$396.44	\$258.68	\$109.06	\$101.55
<b>Total</b>	<b>\$90.20</b>	<b>\$82.28</b>	<b>\$87.53</b>	<b>\$82.28</b>	<b>(\$7.91)</b>	<b>(\$2.67)</b>	<b>(\$7.91)</b>

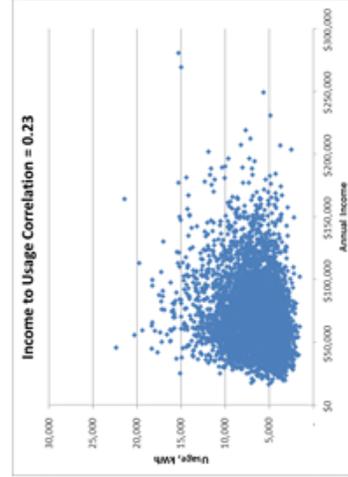
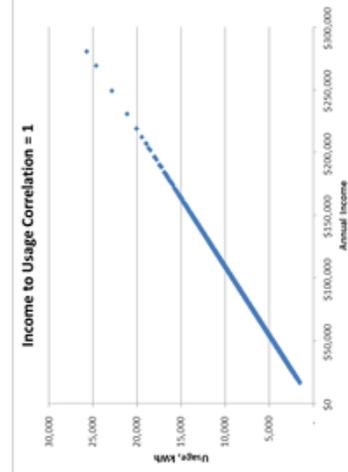
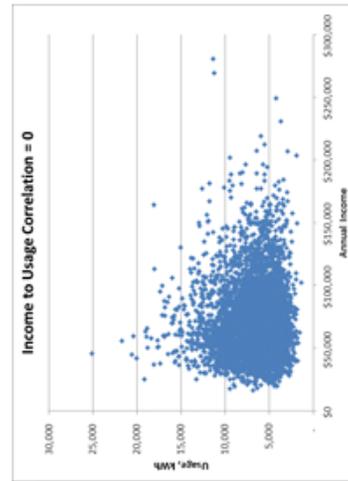
Annual Average Revenue					Difference from Cost		
Average Monthly Usage	Cost Based	Current Total	Non TOU Flat Rate Total	TOU Total	Current Total	Non TOU Flat Rate Total	TOU Total
100	\$69,387,243.00	\$18,594,402.13	\$22,738,620.93	\$22,399,544.40	(\$50,792,840.87)	(\$46,648,622.07)	(\$46,987,698.60)
200	\$233,884,244.04	\$98,376,400.03	\$137,358,129.28	\$134,597,404.02	(\$135,507,844.01)	(\$96,526,114.76)	(\$99,286,840.02)
300	\$363,133,283.84	\$187,736,888.60	\$264,230,973.18	\$261,474,507.65	(\$175,396,395.24)	(\$98,902,310.65)	(\$101,658,776.19)
400	\$672,490,892.89	\$429,092,426.63	\$574,407,020.29	\$567,122,052.45	(\$243,398,466.26)	(\$98,083,872.60)	(\$105,368,840.45)
500	\$568,400,293.52	\$415,988,566.07	\$530,785,555.22	\$528,034,143.50	(\$152,411,727.44)	(\$37,614,738.29)	(\$40,366,150.02)
600	\$601,964,878.96	\$466,862,557.31	\$566,541,260.94	\$571,097,824.48	(\$135,102,321.65)	(\$35,423,618.03)	(\$30,867,054.49)
700	\$520,333,818.82	\$504,467,850.55	\$536,546,338.99	\$539,309,255.53	(\$15,865,968.27)	\$16,212,520.17	\$18,975,436.71
800	\$505,088,921.02	\$498,568,032.33	\$512,733,062.77	\$519,420,149.67	(\$6,520,888.69)	\$7,644,141.76	\$14,331,228.65
900	\$376,341,553.82	\$409,531,012.41	\$394,536,902.06	\$399,694,298.93	\$33,189,458.59	\$18,195,348.24	\$23,352,745.10
1000	\$206,286,181.88	\$244,800,075.09	\$229,201,209.50	\$230,385,187.23	\$38,513,893.20	\$22,915,027.62	\$24,099,005.34
1100	\$188,871,319.48	\$233,068,589.43	\$212,933,400.30	\$216,328,911.16	\$44,197,269.95	\$24,062,080.81	\$27,457,591.68
1200	\$179,040,976.34	\$264,519,352.79	\$219,587,135.70	\$221,556,379.47	\$85,478,376.45	\$40,546,159.35	\$42,515,403.12
1300	\$109,665,532.50	\$139,899,503.69	\$126,734,212.32	\$128,765,772.93	\$30,233,971.19	\$17,068,679.82	\$19,100,240.43
1400	\$101,824,355.27	\$148,446,522.64	\$126,692,234.94	\$126,484,182.12	\$46,622,167.36	\$24,867,879.66	\$24,659,826.84
1500	\$83,541,287.62	\$107,373,199.04	\$101,855,353.11	\$102,345,290.50	\$23,831,911.43	\$18,314,065.50	\$18,804,002.88
1600	\$33,341,009.25	\$45,326,784.76	\$39,476,585.07	\$40,450,558.65	\$11,985,775.50	\$6,135,575.82	\$7,109,549.39
1700	\$30,953,570.13	\$58,431,475.72	\$42,268,745.29	\$42,315,118.15	\$27,477,905.59	\$11,315,175.15	\$11,361,548.02
1800	\$12,966,154.29	\$23,161,717.65	\$18,040,884.67	\$18,011,124.49	\$10,195,563.35	\$5,074,730.38	\$5,044,970.20
1900	\$10,245,123.75	\$16,653,010.23	\$13,243,721.76	\$13,189,572.24	\$6,407,886.48	\$2,998,598.01	\$2,944,448.49
2000	\$134,476,191.43	\$252,435,884.71	\$184,207,686.26	\$180,782,356.66	\$117,959,693.28	\$49,731,494.82	\$46,306,165.12
<b>Total</b>	<b>\$4,961,403,151</b>	<b>\$4,527,486,254</b>	<b>\$4,814,750,860</b>	<b>\$4,824,198,940</b>	<b>(\$433,916,898)</b>	<b>(\$146,652,292)</b>	<b>(\$137,204,211)</b>

## Appendix D: “Correlation” Tab

### Correlation Between Usage and Income Data Shows Income Is A Poor Predictor of Usage

- Common Assumption:
  - High income households have a high usage.
- Results from Data Analysis:
  - Usage has poor correlation with Income.

Area	All Customers	Non-CARE	CARE
Coast (Q, T, V)	0.26	0.23	0.15
Hills (X)	0.37	0.33	0.41
Inner Valley (S, P)	0.27	0.17	0.27
Outer Valley (R, W, Y, Z)	0.20	0.11	0.27
PG&E Territory	0.23	0.18	0.26



#### Note

Income data have been obtained from RASS 2009 sample. Customers who qualify for CARE program due to their income and number of households have been considered as CARE customers. The correlation charts are illustrative only based on the assumption that income and usage are log-normally distributed.

*Income versus Usage for non-CARE Households*

- Many non-CARE, low-income households have high usage\* .

Income Range	Total Non-CARE Households	High Usage Non-CARE Households
30K to < 60 K	865,000	297,000 (34%)

- At the same time, many non-CARE, high-income households have low usage\* .

Income Range	Total Non-CARE Households	Low Usage Non-CARE Households
100K and Above	1,063,000	435,000 (41%)

**NOTE**  
 \*High usage households are defined to have Tier-3 and above usage in all 12 months of 2009. The remaining customers are defined to be Low Usage households. Customers who qualify for CARE program due to their income and number of household members have been considered as CARE customers.

## Lack of Correlation Causes Subsidization By Lower Income Households

- Many high-income customers pay below the cost.

Income	Annual Usage (kWh)	Annual Bill Amount	Annual Cost Based Amount	Under Payment
175,000	6,596	\$805	\$1,074	(\$269)
125,000	5,740	\$674	\$935	(\$261)
125,000	5,468	\$636	\$891	(\$254)
125,000	6,924	\$879	\$1,128	(\$249)

- At the same time, many low-income customers pay above the cost.

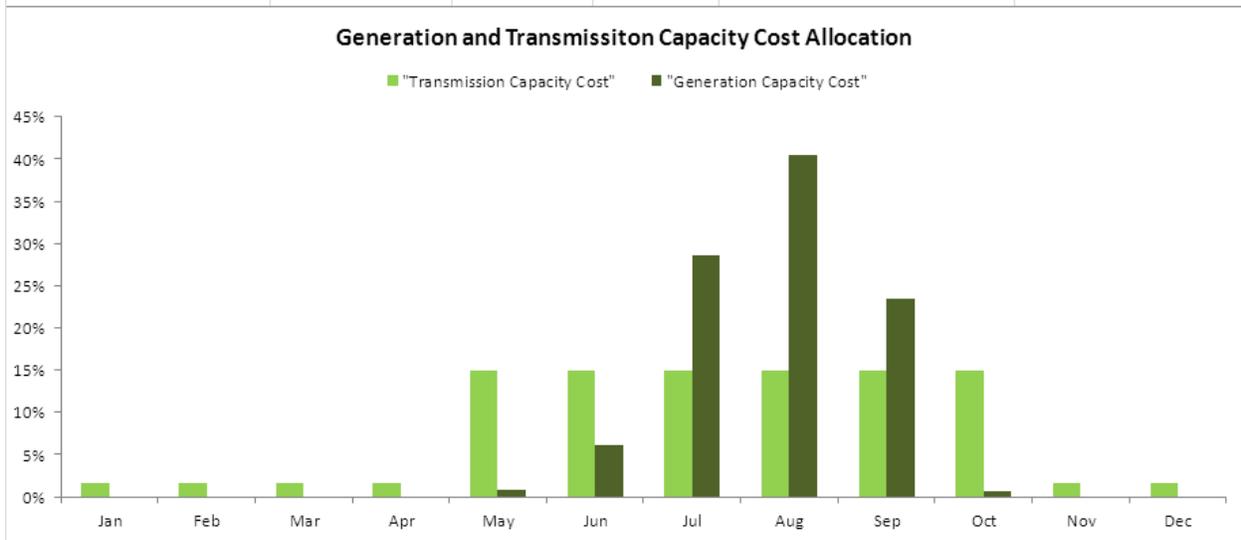
Income	Annual Usage (kWh)	Annual Bill Amount	Annual Cost Based Amount	Over Payment
55,000	12,675	\$2,631	\$2,065	\$567
55,000	13,988	\$3,099	\$2,279	\$821
67,500	15,384	\$3,612	\$2,506	\$1,106
45,000	15,147	\$3,717	\$2,467	\$1,250

- In 2009,
  - approximately 20% of the "low income" households over paid. There are approximately 30% "low income" households.
  - approximately 34% of the "high income" households have overpaid, which means that about 66% of the high income households have under-paid. There are approximately 23% "high income" households.

**Note**  
 These are basic, full service customers from climate zone "S" (Contra Costa, Yolo, Solano and San Joaquin counties). All of them are under E-1 rate schedule and do not qualify for CARE program (based on their household income and number of household members). March 1, 2009 rates have been used to calculate Annual Bill Amount. Residential average rate as of Mar 1, 2009 (\$0.16289/kWh) has been used to calculate Annual Cost Based Amount.

## Appendix E: "Cost-Based-Rate-Drivers" Tab

Cost Basis					
Cost Components		Marginal Cost	Unit	Allocation	Other
Generation Energy Charge	Summer, on-peak	5.89	Cents/kWh	Volumetric	
	Summer, part-peak	5.41	Cents/kWh		
	Summer, Off-peak	3.95	Cents/kWh		
	Winter, on-peak	5.35	Cents/kWh		
	Winter, off-peak	4.09	Cents/kWh		
Generation Capacity Cost	Annual	109.32	\$/kW-yr	Allocated to summer months.	Reserve margin = 15%
Transmission Capacity Cost	Annual	71.13	\$/kW-yr	Allocated to summer months	Line Loss = 7%
Distribution Capacity Cost	Primary	96.43	\$/kW-yr	Allocated equally to all months	Line Loss = 5.3%
	Secondary	1.37	\$/kW-yr	Allocated equally to all months	Line Loss = 5.3%
Customer Access Charge		154.60	\$/year	Allocated equally to all months	
Other Fixed Charge		103.71	\$/year	Allocated equally to all months	



## Appendix F: “Energy Conservation” Tab

**Illustrative Energy Conservation Estimation Using Elasticity of Usage**

The results below are based on 100% volumetric rate designs

**Energy Conservation**

	Current Rate	Proposed Non TOU Rate	Proposed TOU Rate
Usage , kWh	29,201,592,102	28,606,680,098	28,551,662,481
Conserved kWh		594,912,004	649,929,621
Percent conserved		2.04%	2.23%

**Summary Of Rates**

	Current Rates		Proposed Non TOU Rate			Proposed TOU Rate	
	NonCARE	CARE	NonCARE	CARE		NonCARE	CARE
Tier-1	\$0.12845	\$0.08316	\$0.15983	\$0.11987	Summer, on-peak	\$0.25264	\$0.20211
Tier-2	\$0.14602	\$0.09563	\$0.15983	\$0.11987	Summer, part-peak	\$0.19434	\$0.15547
Tier-3	\$0.29561	\$0.12474	\$0.15983	\$0.11987	Summer, off-peak	\$0.14949	\$0.11959
Tier-4	\$0.33561	\$0.12474	\$0.15983	\$0.11987	Winter, part-peak	\$0.15547	\$0.12438
Tier-5	\$0.33561	\$0.12474	\$0.15983	\$0.11987	Winter, off-peak	\$0.14949	\$0.11959

**Summary of Usage**

	Current Rate		Proposed Non TOU Rate			Proposed TOU Rate	
	NonCARE	CARE	NonCARE	CARE		NonCARE	CARE
Tier-1	12,931,439,173	5,304,540,264	12,299,675,120	4,836,211,227	Summer, on-peak	2,059,274,687	795,948,750
Tier-2	2,448,948,725	864,161,597	2,402,636,211	820,352,064	Summer, part-peak	2,265,952,964	822,420,304
Tier-3	3,325,362,437	1,686,208,205	3,630,851,093	1,699,373,741	Summer, off-peak	6,113,480,276	2,138,002,933
Tier-4	1,696,415,829		1,874,122,674		Winter, part-peak	1,265,077,414	406,455,341
Tier-5	944,515,873		1,043,457,968		Winter, off-peak	9,520,998,675	3,164,051,138
Total	21,346,682,036	7,854,910,066	21,250,743,066	7,355,937,032	Total	21,224,784,016	7,326,878,466

**Methodology**

The energy conservation calculation is done in two steps.

Step 1: Energy conservation due to moving from the current rate to proposed non-TOU rate is calculated.

Step 2: Energy conservation due to moving from the proposed non-TOU rate to proposed TOU rate is calculated.

This methodology is based on a survey data that requires a two step calculation.

**Consumption Change: Current Rate Design to Proposed Non TOU Rate**

Non-CARE	Tier	Current Rate Based usage (kWh/yr)	Current Rate (\$/kWh)	New price (\$/kWh)	Change in price (%)	Price elasticity	Change in quantity (%)	Proposed Non TOU usage (kWh/yr)	Change in usage (kWh/yr)
	1	12,931,439,173	\$0.12845	\$0.15983	24.4%	-0.20	-4.9%	12,299,675,120	(631,764,053)
	2	2,448,948,725	\$0.14602	\$0.15983	9.5%	-0.20	-1.9%	2,402,636,211	(46,312,515)
	3	3,325,362,437	\$0.29561	\$0.15983	-45.9%	-0.20	9.2%	3,630,851,093	305,488,656
	4	1,696,415,829	\$0.33561	\$0.15983	-52.4%	-0.20	10.5%	1,874,122,674	177,706,846
	5	944,515,873	\$0.33561	\$0.15983	-52.4%	-0.20	10.5%	1,043,457,968	98,942,095
	Total	21,346,682,036					-0.45%	21,250,743,066	(95,938,970)

CARE	Tier	Current usage (kWh/yr)	2020 IBR Rate (\$/kWh)	New price (\$/kWh)	Change in price (%)	Price elasticity	Change in quantity (%)	Proposed Non TOU usage (kWh/yr)	Change in usage (kWh/yr)
	1	5,304,540,264	\$0.08316	\$0.11987	44.1%	-0.20	-8.8%	4,836,211,227	(468,329,037)
	2	864,161,597	\$0.09563	\$0.11987	25.3%	-0.20	-5.1%	820,352,064	(43,809,533)
	3	1,686,208,205	\$0.12474	\$0.11987	-3.9%	-0.20	0.8%	1,699,373,741	13,165,535
	Total	7,854,910,066					-6.35%	7,355,937,032	(498,973,034)

**Consumption Change: Proposed Non TOU Rate to Proposed TOU Rate**

Non-CARE	Summer	Hours per season	Customer usage per season (kWh/season)	Customer usage per hour (kWh/hour)	Old Rate (\$/kWh)	New Rate (\$/kWh)	Consumption Change (%)	New Customer usage per season (kWh/season)	Change in usage (kWh/season)
	Peak	768	2,224,129,341	2,896,002	\$0.15983	\$0.252641	-7.41%	2,059,274,687	(164,854,655)
	Partial-Peak	958	2,322,244,691	2,424,055	\$0.15983	\$0.194339	-2.42%	2,265,952,964	(56,291,727)
	Off-Peak	2,630	5,945,069,457	2,210,063	\$0.15983	\$0.149491	2.83%	6,113,480,276	168,410,819
	Total	4,416	10,491,443,489					10,438,707,927	(52,735,563)

Non-CARE	Winter	Hours per season	Customer usage per season (kWh/season)	Customer usage per hour (kWh/hour)	Old Rate (\$/kWh)	New Rate (\$/kWh)	Consumption Change (%)	New Customer usage per season (kWh/season)	Change in usage (kWh/season)
	Partial-Peak	381	1,270,700,916	3,335,173	\$0.15983	\$0.15547	-0.44%	1,265,077,414	(5,623,502)
	Off-Peak	3,963	9,488,538,661	2,394,297	\$0.15983	\$0.14949	0.34%	9,520,998,675	32,460,014
	Total	4,344	10,759,239,576					10,786,076,089	26,776,513

CARE	Summer	Hours per season	Customer usage per season (kWh/season)	Customer usage per hour (kWh/hour)	Old Rate (\$/kWh)	New Rate (\$/kWh)	Consumption Change (%)	New Customer usage per season (kWh/season)	Change in usage (kWh/season)
	Peak	768	860,459,735	1,120,390	\$0.11987	\$0.20211	-7.50%	795,948,750	(64,510,985)
	Partial-Peak	958	843,627,252	880,613	\$0.11987	\$0.15547	-2.51%	822,420,304	(21,206,949)
	Off-Peak	2,630	2,081,020,714	773,614	\$0.11987	\$0.11959	2.74%	2,138,002,933	56,982,218
	Total	4,416	3,785,107,702					3,756,371,987	(28,735,715)

CARE	Winter	Hours per season	Customer usage per season (kWh/season)	Customer usage per hour (kWh/hour)	Old Rate (\$/kWh)	New Rate (\$/kWh)	Consumption Change (%)	New Customer usage per season (kWh/season)	Change in usage (kWh/season)
	Partial-Peak	381	409,326,267	1,074,347	\$0.11987	\$0.12438	-0.70%	406,455,341	(2,870,927)
	Off-Peak	3,963	3,161,603,063	797,755	\$0.11987	\$0.11959	0.08%	3,164,051,138	2,548,075
	Total	4,344	3,570,929,330					3,570,506,479	(322,851)

## Customer Count by Federal Poverty Level

The customer count shown below is based on the income data available from the RASS 2009 study conducted by CEC.

Customer Count	Above 300%	200% to 300%	100% to 200%	100% and below	Total
Federal Poverty Level					
Non-CARE	2,507,400	349,730	391,750	104,668	3,353,549
CARE	232,292	180,987	561,999	292,753	1,268,031
Total	2,739,692	530,717	953,749	397,422	4,621,580

## Changes Made to the Model since the Last Version (Dec 2012)

Several model input flexibilities, rate design and reporting features have been added to the model since the last version submitted to Energy Division. These are listed below.

### Changes Added in February 2013 Version

1. Baseline quantity can be now chosen from 40% to 55% in the increment of 1% in addition to the using the baseline quantity from the sample data.
2. Model now provides the model users ability to model a rate design scenario with a non-TOU baseline rate, and un-tiered TOU rates for usage above the baseline.
3. CARE discount can be of separate values for tiers 1, 2 and 3. Customer charge, minimum bill and fixed demand charges will be subject to tier-1 CARE discount.
4. All feasible tier collapsing, for non-TOU two, three or four tiered rate structure scenarios are now user defined.
5. Minimum bill amount can now be applicable to delivery charges only, if so desired by the model user. User can also choose to apply minimum bill amount to the total bill amount.
6. The rate design results are reported now by baseline territory, and the aggregation at "Coast", "Hill", "Inner Valley" and "Outer Valley" have been removed.
7. A reporting tab "Bill Impact Output-2" has been added. In this tab, the customer counts are reported at 25 different groups across percent bill impact and dollar bill impact dimensions for non-CARE and CARE customers separately for both non-TOU and TOU rate design scenarios.
8. A "Load Factor Output" reporting tab has been added that shows the impacts disaggregated into a low, med, and high load factor levels.
9. Cost Base Revenue Requirement input in the "Detailed Input" tab formula has been changed to correctly display the revenue requirements used by the model for rate design, while zeroing out the column that is not used.

## Changes Added in March 2013 (FINAL) Version

1. The “Guideline” tab has been updated to reflect the modifications since the December version.
2. Distribution “New Business” Marginal Cost has been added as an input in the “Detailed Inputs” tab. This marginal cost will now be used along with the Distribution “Primary” cost in the cost based bill amount calculation.
3. The “Other Cost” component can now be partially or fully a volumetric cost. The user can choose the percent of “Other Cost” that should be treated as volumetric (\$/kWh). This is possible for CARE and non-CARE customers separately.
4. The calculation of Current Bill amount has been modified to use the “Baseline Allowance Percent” chosen by the user, rather than defaulting it to the historical baseline data.
5. Percent of Sample choice in the “Detailed Inputs” tab has been updated.
6. Description for the elasticity estimates has been added in the “FlattoTOUCalc-Summer” tab.
7. Energy Conservation calculation has been linked to model runs so that the update of the energy conservation estimate for the non-TOU rate structure take place automatically.
8. Print formatting of the output and input tabs have been provided.
9. A separate table to show bill impact by income range has been added in “PGE-Bill-Impact-Output-3” tab.
10. In the “Detailed Inputs” tab, the input cells have been color coded with yellow. If the user chooses to change the default values of the inputs, then such inputs will automatically be highlighted red. In addition, the default values can be restored by clicking the macro button “Restore Default Detailed Inputs” in this tab.
11. User instructions have been added for the tier collapsing criteria in the “Detailed Inputs” tab.
12. The choice of “Baseline Allowance Percent” has now been extended from 40% to 55% range to 40% to 60% range.
13. An Income based discount mechanism that can be adopted in lieu of the tiered CARE discount has been added in the model. A tab called “IncomeBasedDiscount” has been added to perform calculation for this functionality.
14. Output tabs that change with the results of the rate designs have been color coded as purple.
15. A print macro has been added in the “Summary” tab that allows printing of all relevant inputs and outputs of the model.
16. Labeling changes have been made in the Energy Conservation Tab. Also, summary outputs have been added in the top area of this tab.
17. On the “Summary” tab, we have added the Step numbering as a label on the button.
18. We have included explanation of source of input data and how it’s derived in the Manual.
19. We have added the count of customers in each poverty level range in the manual.

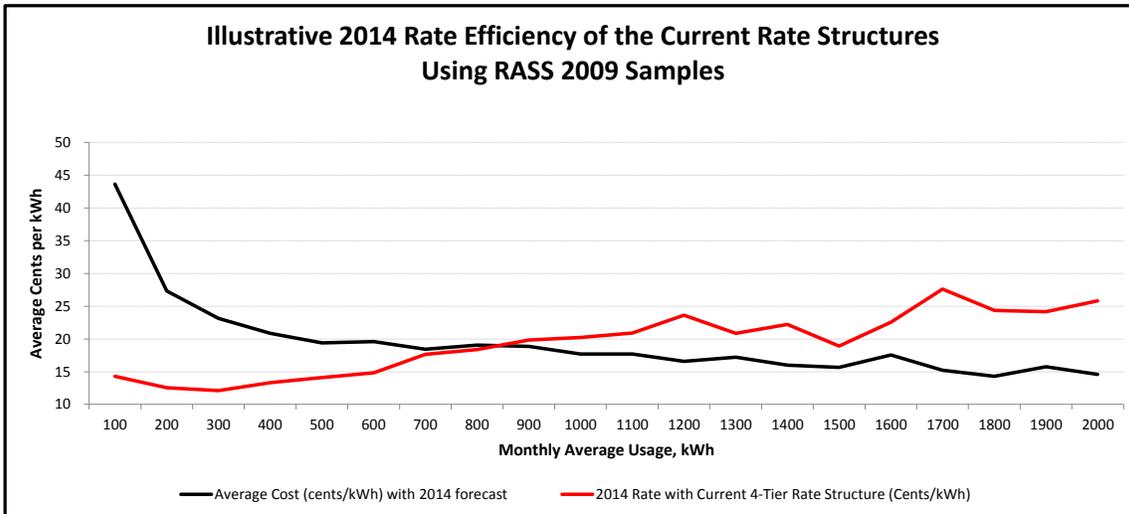


***PACIFIC GAS AND ELECTRIC COMPANY***

***APPENDIX C***

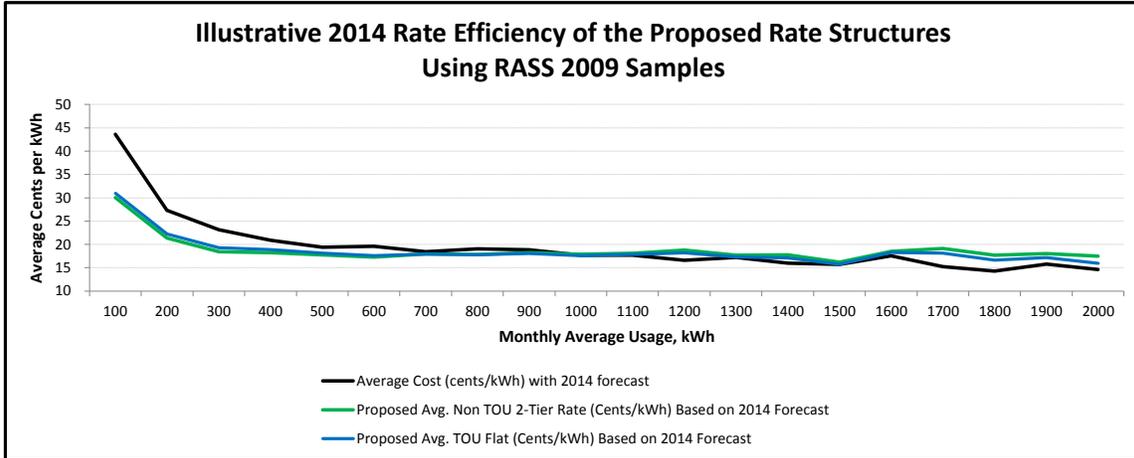
***BILL IMPACT CALCULATOR RESULTS PURSUANT TO  
ALJ RULING, MARCH 19, 2013, ATTACHMENT B***

FIGURE 4-1 – ILLUSTRATIVE 2014 RATE EFFICIENCY OF THE CURRENT RATE STRUCTURES USING RASS 2009 SAMPLES



Cost of Service vs. Current and Proposed Rate Designs								
Average Monthly Usage	Average Cost (cents/kWh) with 2014 forecast	Average Current Rate (Cents/kWh)	2014 Rate with Current 4-Tier Rate Structure (Cents/kWh)	Proposed Avg. TOU Flat (Cents/kWh)	Percent Change-Current	Percent Change-Proposed Non TOU 4-Tier Rate	Percent Change-Proposed TOU	
100	43.63	13.99	14.29	22.86	-68%	-67%	-48%	
200	27.30	12.25	12.57	19.29	-55%	-54%	-29%	
300	23.13	11.81	12.10	17.78	-49%	-48%	-23%	
400	20.88	12.88	13.30	18.34	-38%	-36%	-12%	
500	19.41	13.56	14.11	18.23	-30%	-27%	-6%	
600	19.62	14.16	14.81	18.09	-28%	-25%	-8%	
700	18.45	16.63	17.65	19.10	-10%	-4%	4%	
800	19.05	17.26	18.40	19.13	-9%	-3%	0%	
900	18.86	18.52	19.82	19.75	-2%	5%	5%	
1000	17.71	18.87	20.23	19.36	7%	14%	9%	
1100	17.70	19.46	20.93	19.77	10%	18%	12%	
1200	16.56	21.81	23.61	20.63	32%	43%	25%	
1300	17.23	19.47	20.86	19.36	13%	21%	12%	
1400	16.02	20.63	22.24	19.40	29%	39%	21%	
1500	15.68	17.72	18.90	17.51	13%	21%	12%	
1600	17.57	20.90	22.55	20.63	19%	28%	17%	
1700	15.20	25.28	27.61	21.23	66%	82%	40%	
1800	14.31	22.54	24.37	19.39	58%	70%	36%	
1900	15.77	22.30	24.18	19.81	41%	53%	26%	
2000	14.59	23.83	25.82	19.02	63%	77%	30%	

FIGURE 4-2 – ILLUSTRATIVE 2014 RATE EFFICIENCY OF THE PROPOSED RATE STRUCTURES USING RASS 2009 SAMPLES



Cost of Service vs. Current and Proposed Rate Designs							
Average Monthly Usage	Average Cost (cents/kWh) with 2014 forecast	Average 2013 Current Rate (Cents/kWh)	Proposed Avg. Non TOU 2-Tier Rate (Cents/kWh) Based on 2014 Forecast	Proposed Avg. TOU Flat (Cents/kWh) Based on 2014 Forecast	Percent Change-Current	Percent Change-Proposed Non TOU 2-Tier Rate	Percent Change-Proposed TOU
100	43.63	13.99	30.02	30.99	-68%	-31%	-29%
200	27.30	12.25	21.34	22.21	-55%	-22%	-19%
300	23.13	11.81	18.44	19.32	-49%	-20%	-16%
400	20.88	12.88	18.27	18.85	-38%	-13%	-10%
500	19.41	13.56	17.75	18.13	-30%	-9%	-7%
600	19.62	14.16	17.30	17.61	-28%	-12%	-10%
700	18.45	16.63	17.97	17.94	-10%	-3%	-3%
800	19.05	17.26	17.82	17.81	-9%	-6%	-7%
900	18.86	18.52	18.21	18.09	-2%	-3%	-4%
1000	17.71	18.87	17.89	17.57	7%	1%	-1%
1100	17.70	19.46	18.08	17.85	10%	2%	1%
1200	16.56	21.81	18.76	18.23	32%	13%	10%
1300	17.23	19.47	17.66	17.31	13%	2%	0%
1400	16.02	20.63	17.78	17.10	29%	11%	7%
1500	15.68	17.72	16.22	15.75	13%	3%	0%
1600	17.57	20.90	18.52	18.29	19%	5%	4%
1700	15.20	25.28	19.13	18.10	66%	26%	19%
1800	14.31	22.54	17.71	16.65	58%	24%	16%
1900	15.77	22.30	18.02	17.14	41%	14%	9%
2000	14.59	23.83	17.47	15.93	63%	20%	9%

**4.5 Energy Conservation: "The results showed reductions in overall energy usage between approximately 2% to 3%..."**

Lower Percent	2%
Higher Percent	3%

**Illustrative Energy Conservation Estimation Using Elasticity of Usage**

The results below are based on 100% volumetric rate designs  
**2014**

Energy Conservation	Current Rate	Non TOU Rate	TOU Rate
Usage , kWh	29,201,592,102	28,623,303,251	28,547,159,725
Conserved kWh		578,288,851	654,432,377
Percent conserved		1.98%	2.24%

**2017**

Energy Conservation	Current Rate	Non TOU Rate	TOU Rate
Usage , kWh	29,201,592,102	28,296,133,023	28,220,885,681
Conserved kWh		905,459,079	980,706,421
Percent conserved		3.10%	3.36%