# Energy Division Staff Proposal on Residential Rate Reform

*Staff Proposal for Residential Rate Reform in Compliance with R.12-06-013 and Assembly Bill 327*

California Public Utilities Commission

# CALIFORNIA PUBLIC UTILITIES COMMISSION

## *Staff Proposal for Residential Rate Reform in Compliance with R.12-06-013 and Assembly Bill 327*

**Energy Division | May 9, 2014**

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# 1 INTRODUCTION

On June 21, 2012, the Commission instituted Rulemaking 12-06-013 on its own motion to examine current residential electric rate design, including the tier structure in effect for residential customers, the state of time variant and dynamic pricing, potential pathways from tiers to time variant[1] and dynamic pricing, and preferable residential rate design to be implemented when statutory restrictions are lifted.

In the proceeding record development process to date, parties have been asked to evaluate whether and to what extent the existing rate structure fulfills a set of ten guiding principles, and parties have filed rate design proposals for a path forward that conform with these principles and eliminate some of the distortions and inequities that exist in current residential retail rates.

This Energy Division staff proposal for changes to residential electric rate design is informed by the results of this record-development process. The proposal includes a gradual transition to default time of use (TOU) rates starting in 2018, with an optional 2-tier non-time varying rate that customers can opt out to. The proposal includes robust customer education and customer friendly protections. The proposal aims to meet Commission policy priorities and to comply with the legislative mandates included in Assembly Bill (AB) 327 (Perea, 2013). To develop this proposal, staff evaluated the merits of parties' proposals and examined arguments for and against tiered versus time-variant rates, fixed charges, and existing and proposed customer protections. We include illustrative transitional and end-state rates and associated customer bill impacts generated from the Investor Owned Utility (IOU)[2] bill impact calculators created for this proceeding. These impacts demonstrate that in order to move away from the currently inequitable and unsustainable rate structure, most low and medium consumption customers would experience modest bill increases, while high consumption customers would see modest decreases. On balance the impacts are reasonable and occur over a gradual time horizon.

[1] AB 327 defines "time-variant pricing" to include time-of-use (TOU) rates, critical peak pricing (CPP), and real-time pricing (RTP), but does not include programs that provide customers with discounts from standard tariff rates as an incentive to reduce consumption at certain times, including peak time rebates. For this paper we use time-variant pricing (TVP) as an umbrella term for TOU, CPP, or RTP.

[2] The three large IOUs are: Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE) and San Diego Gas and Electric Company (SDG&E).

## 1.1 SCOPING RULING'S TEN RATE DESIGN PRINCIPLES

To guide the development of an optimal residential retail rate design structure in the R.12-06-013 proceeding the Assigned Commissioner set forth 10 guiding principles after extensive public comments were solicited:

1) Low-income and medical baseline customers should have access to enough electricity to ensure basic needs (such as health and comfort) are met at an affordable cost;
2) Rates should be based on marginal cost;
3) Rates should be based on cost-causation principles;
4) Rates should encourage conservation and energy efficiency;
5) Rates should encourage reduction of both coincident and non-coincident peak demand;
6) Rates should be stable and understandable and provide customer choice;
7) Rates should generally avoid cross-subsidies, unless the cross-subsidies appropriately support explicit state policy goals;
8) Incentives should be explicit and transparent;
9) Rates should encourage economically efficient decision making;
10) Transitions to new rate structures should emphasize customer education and outreach that enhances customer understanding and acceptance of new rates, and minimizes and appropriately considers the bill impacts associated with such transitions.

## 1.2 ORGANIZATION OF THIS REPORT

This staff proposal is organized as follows. Section 2 provides the relevant background, including the historical context for the existing residential rate structure and a summary of AB 327 requirements. Section 3 presents Energy Division staff's proposal for transitional and default rate structures and estimates of the potential bill impacts associated with illustrative rates based on the proposal. Sections 4 through 6 provide additional background discussion and thinking that informed the straw proposal regarding TOU rates, tiered rates, fixed charges, and the California Alternate Rates for Energy (CARE) program, respectively.

## 2 BACKGROUND

A primary issue in this proceeding, at least according to many parties, is that the current tiered rate structure imposes a heavy burden on those customers who use substantial amounts of electricity in the high-cost upper tier rates while simultaneously subsidizing the cost of electricity to low-consumption customers. These distortions are the unintended consequence of the legislative response to the energy crisis, which subsequent legislative reforms were unable to fully address.

As shown in Table 2-1 below, the current upper tier rates (i.e., Tiers 3 and 4) are substantially above the Tier 1 and Tier 2 rates – in all cases, over twice as high as the lower tier rate.

**Table 2-1 – Current[3] IOU Non-CARE and CARE Rates**

| | PG&E | SCE | SDG&E |
|---|---|---|---|
| Non-CARE | | | |
| Tier 1 | 13.2 | 12.8 | 14.8 |
| Tier 2 | 15.0 | 16.0 | 17.1 |
| Tier 3 | 31.1 | 27.2 | 33.7[4] |
| Tier 4 & Above | 35.1 | 31.2 | 35.7 |
| Average | 18.9 | 19.2 | 22.7 |
| | | | |
| CARE | | | |
| Tier 1 | 8.3 | 8.5 | 9.9 |
| Tier 2 | 9.6 | 10.7 | 11.6 |
| Tier 3 & Above | 14.0 | 20.8 | 17.0 |
| Average | 9.7 | 12.2 | 11.4 |

Prior to the energy crisis, PG&E, SCE and SDG&E all had two-tiered residential rates, with a 15 percent differential between the first and second tier (see Table 2-2). Tier 1 was intended to meet a baseline of electricity allocated by the Commission to meet basic

[3] PG&E rates effective May 2013; SCE rates effective April 2013; SDG&E rates effective September 2013 (Corrected per SDG&E's comments filed January 31, 2014 at 2; SDG&E's rates are seasonal. SDG&E rates in Table 2-1 should be identified as annual average rates).

[4] Numerical corrections per SDG&E's comments filed January 31, 2014 at 2

needs at an affordable price[5]. During the 2000-01 energy crisis the Legislature passed AB 1X, forcing the large investor-owned utilities to cap residential electricity rates for Tier 1 and 2 users. This rate cap remained in place until 2009 when the Legislature passed another bill (Senate Bill (SB) 695) allowing for modest increases in rates for Tiers 1 and 2. The changes in the tiered rates since 2000 for SCE, PG&E and SDG&E are shown graphically in Figures 2-1, 2-2 and 2-3. Actual rates are provided in Table 2-2.

With Tiers 1 and 2 rates capped, growth in utility revenue requirements has shifted primarily to customers in Tiers 3 and 4, setting those rates at levels far above the actual cost of providing service to those customers. At the same time, customers that consume in Tiers 1 and 2 pay rates below the average cost of service.

A second major issue in the proceeding is the lack of progress in realizing the Commission policy of transitioning customers to time-variant pricing. The Commission articulated a comprehensive demand response policy in its 2003 Vision Statement.[6] In that statement, the Commission stated that electric customers should have "the ability to increase the value derived from their electricity expenditures by choosing to adjust usage in response to price signals" as customers are equipped with advanced meters as a result of the Commission's Advanced Metering Infrastructure (AMI) decisions. The Energy Action Plan II (EAP II), developed and adopted jointly by the Commission and California Energy Commission (CEC), sets out key actions that both agencies intend to pursue. The EAP II identifies demand response, along with energy efficiency, as the State's "preferred means of meeting growing energy needs."[7] The EAP II concludes that "[w]ith the implementation of well-designed dynamic pricing tariffs and demand response programs for all customer classes, California can lower consumer costs and increase electricity system reliability."[8]

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[5] Baseline Quantity: A quantity of electricity allocated by the Commission for residential customers currently based on from 50-60 percent of average residential consumption (60-70 percent for all-electric customers during the winter heating season). The Commission is required by statute to designate a baseline quantity of electricity which is necessary to supply a significant portion of the reasonable energy needs of average residential customers at affordable prices. In setting those quantities, the Commission was directed to take into account the difference in energy needs between all-electric residences and those with both gas and electric service and to take into account differences in energy use by climatic zone and season. (See Section 739 of the Public Utilities Code.)

[6] California Demand Response: A Vision for the Future (2002-2007).

[7] EAP II, p. 2.

[8] *Id.*, p. 4.

This led to Commission Decision (D.) 08-07-045 in 2008 in which the Commission stated: "This decision continues implementation of the Commission's policy to make dynamic pricing available for all customers. Dynamic pricing can lower costs, improve system reliability, cut greenhouse gas emissions, and support modernization of the electric grid."[9] In the Decision the Commission ordered PG&E "to file an application proposing default TOU/CPP for residential customers 30 days after any change in the law that changes the AB1X rate protections in a manner that could allow default or mandatory time-variant rates for residential customers."[10]

[9] D.08-07-045 at 4.

[10] *Id.*, p. 38, and Ordering Paragraph 8.

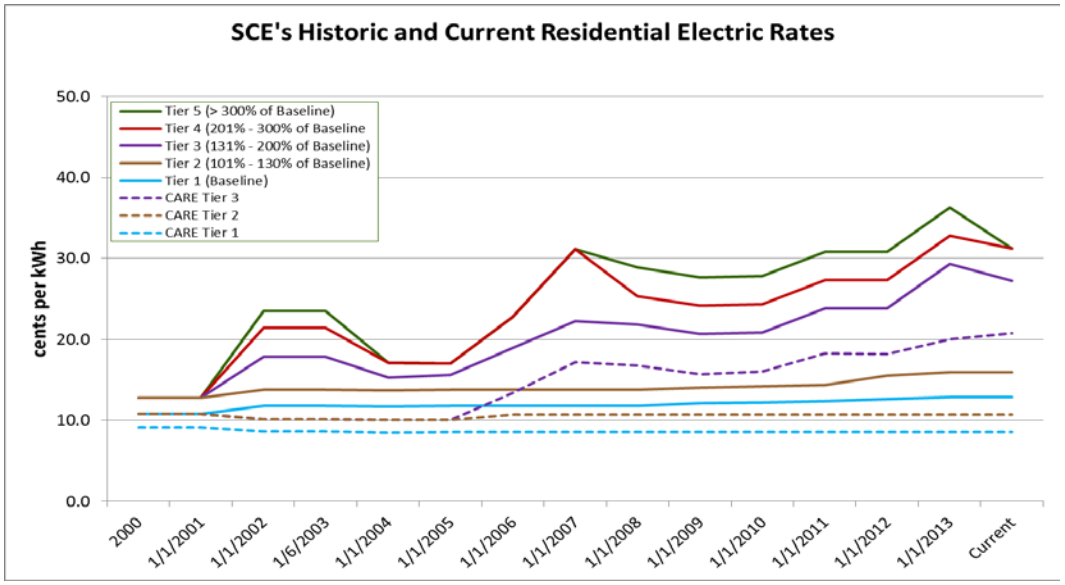


**Figure 2-1: SCE Historic and Current IOU Electric Rates**

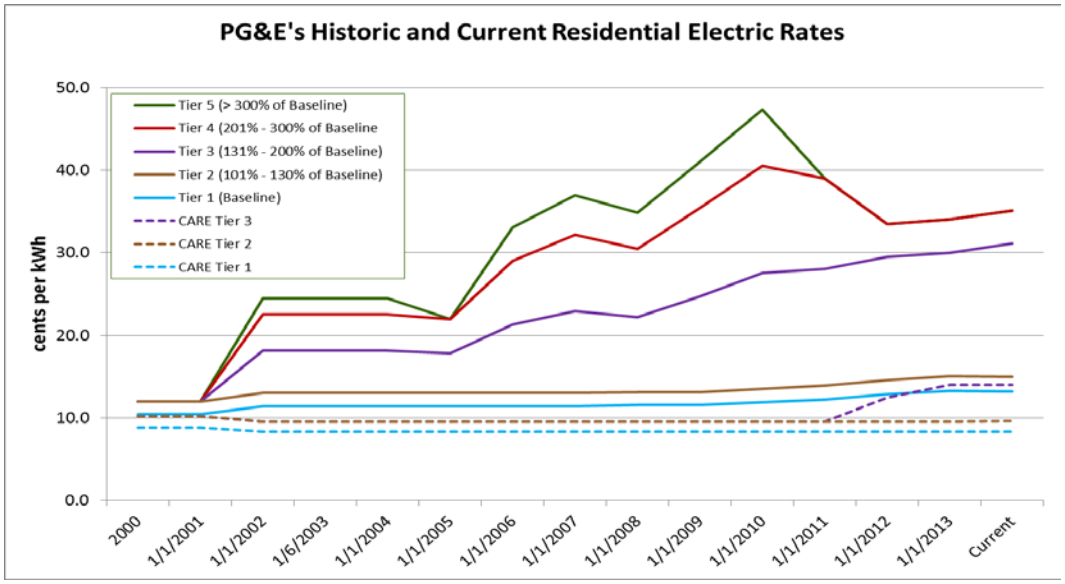


**Figure 2-2: PG&E Historic and Current IOU Electric Rates**

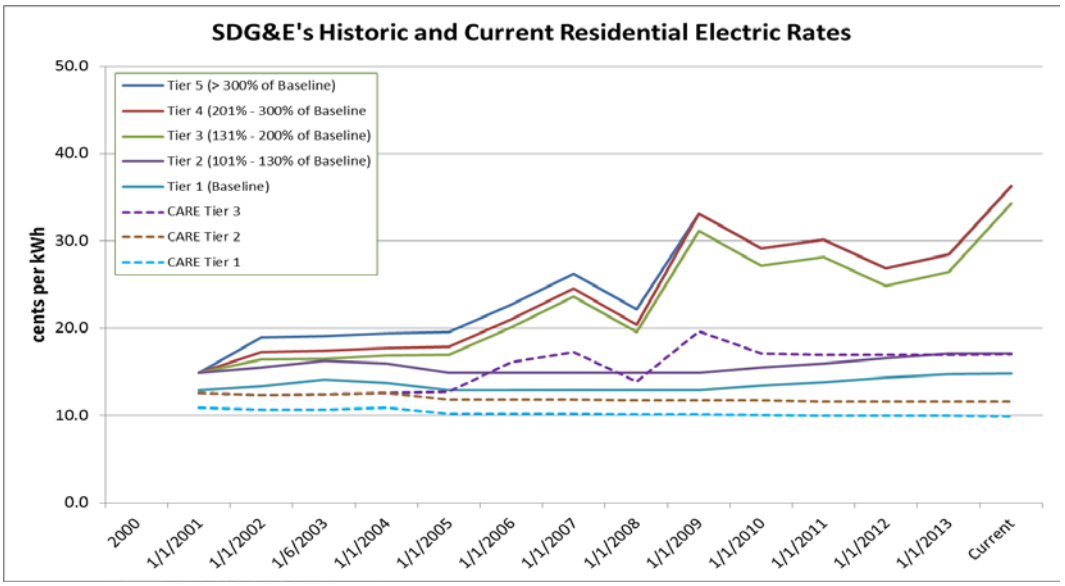


**Figure 2-3: SDG&E Historic and Current IOU Electric Rates**

## Table 2-2: Historic and Current Residential Tiered Rates (PG&E May 2013, SCE April 2013, SDG&E 2013[11])

| SCE | 2000 | 1/1/2001 | 1/1/2002 | 1/6/2003 | 1/1/2004 | 1/1/2005 | 1/1/2006 | 1/1/2007 | 1/1/2008 | 1/1/2009 | 1/1/2010 | 1/1/2011 | 1/1/2012 | 1/1/2013 | Current |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tier 1 (Baseline) | 10.8 | 10.8 | 11.8 | 11.8 | 11.7 | 11.8 | 11.8 | 11.8 | 11.8 | 12.1 | 12.2 | 12.4 | 12.6 | 12.8 | 12.8 |
| Tier 2 (101% - 130% of Baseline) | 12.7 | 12.7 | 13.7 | 13.7 | 13.7 | 13.7 | 13.7 | 13.7 | 13.7 | 14.0 | 14.2 | 14.3 | 15.5 | 16.0 | 16.0 |
| Tier 3 (131% - 200% of Baseline) | 12.7 | 12.7 | 17.8 | 17.8 | 15.3 | 15.6 | 18.9 | 22.3 | 21.9 | 20.6 | 20.8 | 23.8 | 23.8 | 29.3 | 27.2 |
| Tier 4 (201% - 300% of Baseline | 12.7 | 12.7 | 21.4 | 21.4 | 17.1 | 17.0 | 22.7 | 31.2 | 25.4 | 24.1 | 24.3 | 27.3 | 27.3 | 32.8 | 31.2 |
| Tier 5 (> 300% of Baseline) | 12.7 | 12.7 | 23.5 | 23.5 | 17.1 | 17.0 | 22.7 | 31.2 | 28.9 | 27.6 | 27.8 | 30.8 | 30.8 | 36.3 | 31.2 |
| | | | | | | | | | | | | | | | |
| CARE Tier 1 | 9.1 | 9.1 | 8.6 | 8.6 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 |
| CARE Tier 2 | 10.8 | 10.8 | 10.1 | 10.1 | 10.0 | 10.1 | 10.7 | 10.7 | 10.7 | 10.7 | 10.7 | 10.7 | 10.7 | 10.7 | 10.7 |
| CARE Tier 3 | 10.8 | 10.8 | 10.1 | 10.1 | 10.0 | 10.1 | 13.3 | 17.2 | 16.7 | 15.7 | 16.0 | 18.2 | 18.2 | 20.0 | 20.8 |
| | | | | | | | | | | | | | | | |
| **PG&E** | **2000** | **1/1/2001** | **1/1/2002** | **1/1/2003** | **1/1/2004** | **1/1/2005** | **1/1/2006** | **1/1/2007** | **1/1/2008** | **1/1/2009** | **1/1/2010** | **1/1/2011** | **1/1/2012** | **1/1/2013** | **Current** |
| Tier 1 (Baseline) | 10.4 | 10.4 | 11.4 | 11.4 | 11.4 | 11.4 | 11.4 | 11.4 | 11.6 | 11.5 | 11.9 | 12.2 | 12.8 | 13.2 | 13.2 |
| Tier 2 (101% - 130% of Baseline) | 12.0 | 12.0 | 13.0 | 13.0 | 13.0 | 13.0 | 13.0 | 13.0 | 13.1 | 13.1 | 13.5 | 13.9 | 14.6 | 15.0 | 15.0 |
| Tier 3 (131% - 200% of Baseline) | 12.0 | 12.0 | 18.1 | 18.1 | 18.1 | 17.8 | 21.3 | 22.9 | 22.2 | 24.7 | 27.6 | 28.0 | 29.5 | 30.0 | 31.1 |
| Tier 4 (201% - 300% of Baseline | 12.0 | 12.0 | 22.5 | 22.5 | 22.5 | 22.0 | 29.0 | 32.1 | 30.5 | 35.4 | 40.6 | 39.0 | 33.5 | 34.0 | 35.1 |
| Tier 5 (> 300% of Baseline) | 12.0 | 12.0 | 24.5 | 24.5 | 24.5 | 22.0 | 33.0 | 37.0 | 34.9 | 41.0 | 47.4 | 39.0 | 33.5 | 34.0 | 35.1 |
| | | | | | | | | | | | | | | | |
| CARE Tier 1 | 8.8 | 8.8 | 8.3 | 8.3 | 8.3 | 8.3 | 8.3 | 8.3 | 8.3 | 8.3 | 8.3 | 8.3 | 8.3 | 8.3 | 8.3 |
| CARE Tier 2 | 10.2 | 10.2 | 9.6 | 9.6 | 9.6 | 9.6 | 9.6 | 9.6 | 9.6 | 9.6 | 9.6 | 9.6 | 9.6 | 9.6 | 9.6 |
| CARE Tier 3 | | | | | | | | | | | | | 12.5 | 14.0 | 14.0 |
| | | | | | | | | | | | | | | | |
| **SDG&E** | **2000** | **1/1/2001** | **1/1/2002** | **1/6/2003** | **1/1/2004** | **1/1/2005** | **1/1/2006** | **1/1/2007** | **1/1/2008** | **1/1/2009** | **1/1/2010** | **1/1/2011** | **1/1/2012** | **1/1/2013** | **Current** |
| Tier 1 (Baseline) | | 12.9 | 13.4 | 14.1 | 13.8 | 12.9 | 12.9 | 12.9 | 12.9 | 12.9 | 13.4 | 13.8 | 14.3 | 14.8 | 14.8 |
| Tier 2 (101% - 130% of Baseline) | | 14.9 | 15.5 | 16.3 | 15.9 | 14.9 | 14.9 | 14.9 | 14.9 | 14.9 | 15.5 | 15.9 | 16.6 | 17.1 | 17.1 |
| Tier 3 (131% - 200% of Baseline) | | 14.9 | 16.4 | 16.5 | 16.8 | 17.0 | 20.1 | 23.6 | 19.5 | 31.1 | 27.2 | 28.1 | 24.8 | 26.5 | 34.3 |
| Tier 4 (201% - 300% of Baseline | | 14.9 | 17.3 | 17.4 | 17.7 | 17.9 | 21.0 | 24.5 | 20.4 | 33.1 | 29.2 | 30.1 | 26.8 | 28.5 | 36.3 |
| Tier 5 (> 300% of Baseline) | | 14.9 | 19.0 | 19.1 | 19.4 | 19.6 | 22.7 | 26.2 | 22.1 | 33.1 | 29.2 | 30.1 | 26.8 | 28.5 | 36.3 |
| | | | | | | | | | | | | | | | |
| CARE Tier 1 | | 10.9 | 10.7 | 10.7 | 10.9 | 10.2 | 10.2 | 10.2 | 10.2 | 10.1 | 10.0 | 10.0 | 9.9 | 9.9 | 9.9 |
| CARE Tier 2 | | 12.6 | 12.4 | 12.4 | 12.6 | 11.8 | 11.8 | 11.8 | 11.8 | 11.7 | 11.7 | 11.6 | 11.6 | 11.6 | 11.6 |
| CARE Tier 3 | | 12.6 | 12.4 | 12.4 | 12.6 | 12.8 | 16.1 | 17.3 | 13.9 | 19.7 | 17.1 | 17.0 | 17.0 | 17.0 | 17.0 |

[11] The correct effective date should be September 2013 per SDG&E's comments filed January 31, 2014, p.2. SDG&E states that the current rates shown in Table 2-2 for Tiers 3 and 4 are incorrect, and should be listed as 33.7 and 35.7, respectively, and should be labeled as an annual average.

## 2.1 PROCEDURAL HISTORY

On June 21, 2012, the Commission initiated Rulemaking (R.) 12-06-013 (OIR) on its own motion to examine current residential electric rate design, including the tier structure in effect for residential customers, the state of time variant and dynamic pricing, potential pathways from tiers to time variant and dynamic pricing, and preferable residential rate design to be implemented when statutory restrictions are lifted.

A workshop was held on August 27, 2012 to discuss the themes and preliminary questions. Pursuant to the OIR, and to the September 20, 2012 assigned Commissioner and Administrative Law Judges' Joint Ruling Inviting Comments and Scheduling Prehearing Conference, parties submitted comments and reply comments on the proposed Rate Design Evaluation Questions and Principles. Opening comments were filed on October 5, 2012 and reply comments were filed on October 19, 2012.

Pursuant to the Administrative Law Judge's rulings, parties submitted rate design proposals on May 29, 2013, and a workshop was held on June 25, 2013 for parties to present their proposals and answer questions. Opening comments on parties' rate design proposals were submitted on July 1, 2013 and reply comments on July 15, 2013. The parties submitted "blue sky" proposals for the optimal rate design structure assuming statutory restrictions were lifted. Subsequent to this record development within the proceeding, the Legislature passed AB 327 (Perea), which removes many important rate restrictions and allows the Commission to consider potential residential rate reforms. This bill, which will heavily impact the focus of this proceeding, is summarized in the following section.

## 2.2 ASSEMBLY BILL 327

AB 327 (Perea), recently passed by the Legislature and signed into law on October 7, 2013, removes many of the current restrictions that have limited changes to residential electric rates. With respect to tiered, time variant and CARE rates, fixed charges and rate change transitions, AB 327 allows or mandates the following:

**Tiered Rates**

- Requires that each utility offer ***default*** rates to residential customers with at least two usage tiers, at least through 2018. The first tier must include no less than baseline quantities, as defined in current law.

**Time Variant Rates**

- Allows the Commission to require or authorize default time-of-use rates beginning January 1, 2018, but requires the Commission to obtain consent from the medical baseline and third-party notification customers before defaulting them and to ensure that such schedule does not cause unreasonable hardship for senior citizens or economically vulnerable customers in hot climate zones.
- Requires that customers receive one year of interval data before being placed on a ***default*** time-of-use rate and one year of bill protection thereafter.
- Requires that the utilities provide, yearly, a summary of available tariff options and expected annual bill impacts of each of these tariffs.
- Allows residential customers to opt out of default time-variant rates and receive service pursuant to a non-time-variant rate having at least two tiers.
- Allows the Commission to authorize the utilities to offer optional time-of-use and other time-variant pricing rates.

**CARE Rates**

- Requires that the average effective CARE discount be not less than 30 percent or more than 35 percent of the revenues that would have been produced for the same billed usage by non-CARE customers. The average effective CARE discount is defined as the weighted average discount provided to individual customers.
- Requires that if a utility currently provides a discount greater than 35 percent, the currently effective discount in excess of this amount should be reduced by a reasonable amount on an annual basis.[12]
- Requires that the entire discount be provided in the form of a reduction in the overall bill for the eligible CARE customer.
- Revises the eligibility criteria for one-person households to be based on a two-person household guideline.[13]

[12] PG&E is the only utility that currently provides a discount in excess of 35 percent.

[13] This effectively increases the income level under which an individual could qualify for the CARE program.

**Fixed Charges**

- Allows the Commission to adopt new and/or expanded fixed charges, but the Commission must ensure that such charges (1) reasonably reflect the costs of serving small and large customers, (2) not unreasonably impair incentives for conservation and energy efficiency, and (3) not overburden low-income customers. The Commission is not required to adopt fixed charges and may consider whether minimum bills are an appropriate substitute for fixed charges.
- Beginning January 1, 2015, the Commission may authorize fixed charges that do not exceed $10 per month for non-CARE customers and $5 per month for CARE customers. Beginning January 1, 2016, the maximum allowable fixed charge may be adjusted annually by no more than the annual percentage increase in the Consumer Price Index for the prior calendar year.

**Transitions**

- Requires that increases to electrical rates and charges, including the CARE discount, be reasonable and subject to a reasonable phase-in schedule relative to rates and charges in effect prior to January 1, 2014.

## 2.3 SCOPE OF THE STAFF PROPOSAL

Parties to this proceeding submitted proposals assuming that all residential rate restrictions were lifted and outlined the statutory changes necessary to implement these proposals. Since much of the record development in this proceeding was based on a "blue sky" assumption of no legislative restrictions, the staff proposal attempts to synthesize elements of party proposals that we believe best comport with the CPUC rate design guiding principles while also complying with AB 327 requirements. Therefore the staff proposal focuses on the following primary questions in conjunction with the CPUC rate design principles:

1) Should the Commission require the utilities to adopt default time-of-use rates beginning January 1, 2018 or thereafter, and should these default time-of-use rates be tiered or not?
2) Prior to 2018, should the utilities adopt optional time-of-use rates that are not tiered?
3) Should the utilities implement two-, three- or four-tiered rates and how steeply tiered should these rates be? If the utilities implement fewer than four tiers, how

should the tiered rates transition over time to ensure a reasonable phase-in schedule?

4) Should the utilities implement fixed charges and should such charges be phased-in over time concurrent with other changes proposed herein?
5) Should the Commission adopt a different method for implementing the CARE discount and if so, should this be considered in this proceeding or in subsequent phase of this proceeding?
6) How should the utilities and the Commission conduct customer communication, outreach and education, and deploy demand response technologies to prepare customers for new rates and inform them about alternative rate options

# 3 STAFF PROPOSAL ON OPTIMAL RATE STRUCTURE

## 3.1 STAFF PROPOSAL SUMMARY

Based on the analysis provided in Sections 4 through 6, staff recommends a gradual[14] yet deliberate process of transitioning residential customers to time-of-use (TOU) rates, while retaining important affordability protections as prescribed by AB 327. The proposed end-state is either a default, non-tiered, cost-based TOU rate structure or a default TOU rate with a baseline discount (equivalent to a two-tiered TOU rate).[15] In either case, the default rate design could include a minimum bill or a fixed charge that would be determined in the applicable residential rate setting proceeding.

**Default Cost-Based TOU in 2018**

Staff supports TOU pricing for the same reasons as the Commission articulated in D. 08-07-045.[16] Staff recommends the cost-based TOU end state because TOU rates provide

[14] Year 1 is assumed to be January 1, 2015, following a General Rate Case (GRC) or consolidated special rate design window process in 2014. Year 4 is assumed to be 2018, the soonest date on which default TOU can be implemented. 2018 would represent the end state of the 4 year transition to the new rate design structure.

[15] The original January 2014 version of this Staff Report recommended a default, non-tiered TOU rate structure beginning 2018. Subsequently, ORA pointed out in its January 31, 2014 comments its belief that P.U. code Sec. 739 continues to apply, notwithstanding P.U. Code Sec. 745, and requires that a baseline feature be included in any default rate. However, the revised text of this paragraph should not be construed as a change of position, but rather as an acknowledgement that ORA has raised a valid legal question, that needs to be resolved in this OIR proceeding. See, ORA comments filed January 31, 2014, p.6.

[16] In D.08-07-045 on pages 2-3, the Commission states: "First, dynamic pricing can lower costs by more closely aligning retail rates and wholesale system conditions, thereby promoting economically efficient decision-making. In more concrete terms, dynamic pricing can lower peak usage and reduce the need to build additional generation capacity to meet the peak. Furthermore, dynamic pricing, coupled with advanced meters, will enable customers to better manage their electricity usage and reduce their bills. Second, dynamic pricing can improve system reliability by providing customers an incentive to lower their usage when the supply and demand balance is strained or in the face of a system emergency. Dynamic pricing can reduce the bills of a customer who reduces his or her usage in the face of scarce supply. Third, dynamic pricing can connect retail rates with California's greenhouse gas policies. When wholesale energy prices are high, the most inefficient generation sources with high greenhouse gas emissions are generally operating. By linking retail rates to wholesale market conditions, dynamic pricing can discourage customers from consuming polluting power. Conversely, if other time periods are dominated by non-emitting and low-cost resources such as nuclear, water, and wind, dynamic pricing could signal to customers that the supply of power is clean. Finally, dynamic pricing will be a building block of a smarter, more advanced electric grid."

customers with clear price signals that will enable them to reduce their bills by changing their consumption behavior. Staff believes TOU rates will enable utilities to defer costly generation and system upgrades, resulting in reductions in electric system costs, which in turn benefit consumers by reducing or minimizing rate increases.[17] In addition, compared with current tiered rates, staff believes that TOU rates better align with state climate policy by reducing reliance on older generation assets during peak hours, which will lower greenhouse gas (GHG) emissions. Finally, well-designed TOU rate structures will be easier for customers to understand, and they will give customers the ability to control their bills on a daily or even hourly basis by providing information needed to determine when and how to most efficiently use energy in their homes.

**Opt-in Time-Variant Pricing (TVP)**

The Commission should require the utilities to offer customers optional, non-tiered, cost-based TOU and optional Critical Peak Pricing (CPP) rates in transition year 1 and throughout the transition period so that customers can immediately benefit from the opportunity to transition to a cost-based TVP rate.

**Gradually Reduce the Number of Tiers and Tier Differentiation**

Staff is persuaded that three and four tier rates with wide spreads between the tiers grossly distort the energy prices seen by customers leading to great inequities among different customers and economically inefficient behavior. Staff recommends a gradual collapsing of the tiers from four to two and a reduction of the tier differentials. This should occur gradually to minimize customer bill impacts, because customers paying rates below cost will see a modest increase while customers paying rates above cost will see a modest decrease.

In 2018, staff recommends that customers have the option to opt-out of TOU rates onto a two-tier flat rate with a modest 1.2 to 1 tier differential ratio. Such a rate would comply with AB 327 requirements and move flat rates closer to cost while reducing the amount of distortion in present rates. The rationale for the minimum number of tiers and a modest tier differential is to prevent distortions between a cost-based TOU default rate and a non-cost-based tiered rate. Tiered rates could distort prices such that low users have a "self-selection bias" towards remaining on a below-cost tiered rate if they can remain within tier 1 usage. This would undermine the Commission's goal of migrating customers to cost-based TOU rates.

[17] We note that ORA analysis indicates that cost-based TOU with 50% penetration can reduce summer on-peak load by approximately 2400 megawatts (MW).

**Minimum Bill or Fixed Charge Determined in Future Rate-Setting Proceedings**

Staff believes that either a minimum bill requirement or a fixed charge for residential customers is consistent with the Commission's rate design principles. Each will advance different principles more than others and each has its trade-offs as discussed in detail in Section 5. Staff recommends one of two options be adopted in the next rate setting proceeding of each utility:

A) Minimum Bill – A minimum bill charge addresses the utilities' concern that customers who are able to net their bills to zero are "free riders" who do not pay for any of the infrastructure that is required to serve them. However, the minimum bill approach allows for the continued recovery of most fixed costs via a volumetric rate that blends the infrastructure and energy costs for the vast majority of residential customers, exaggerating the price signal to encourage adoption of efficiency, demand response, and distributed generation resources consistent with the loading order. Staff proposes that if the minimum residential bill requirement is retained, it be set at least equal to the fixed charges permissible under AB 327 beginning in 2015 ($10/month for non-CARE customers and $5/month for CARE customers, thereafter increasing with the rate of inflation).

B) Fixed Charge – Adding a modest fixed customer charge will better align residential rate design with the principle of cost-causation and further reduce some of the cross-subsidies in rates. Large users are paying a disproportionate share of infrastructure costs through volumetric rates while small users are underpaying. If the Commission orders IOUs to adopt a fixed charge, staff recommends that it be gradually introduced given the other rate changes customers will face if the rate design recommendations of this staff report are enacted. Staff proposes that if a fixed charge is adopted that it be phased in by starting at no more than $5 per month, and then increasing annually to $7.50 and then to $10. Thereafter, it would increase with the rate of inflation.

**CARE Discount Consistent with 30-35% Requirements of AB 327**

The average effective CARE discount is defined by AB 327 as the weighted average discount provided to individual customers. This gives the Commission some latitude to determine whether the 30-35% CARE discount be provided as: a) an equal 30-35 percent volumetric discount off each CARE customer's bill, b) a volumetric discount differentiated by tier, c) a lump sum discount for all CARE customers, or d) a discount differentiated by income level. There are pros and cons to each of the identified options which are discussed in greater detail in Section 6. Staff recommends further vetting of

these four (or additional) options in a subsequent phase of this proceeding. As an interim approach for implementing the new AB 327 CARE requirements, the Commission should adopt option A until it decides on another method. Option A is the simplest method for customers to understand. SDG&E and SCE CARE rates should change as needed to comply with the 30-35% discount range, while PG&E's CARE discounts will need to be reduced gradually over several years to reach the mandated level.

**Customer Communication, Outreach and Education, and Technology**

Staff recommends that robust communication, outreach and education should accompany the transition from tiered rates to TOU and optional CPP rates. Customers will need to be made aware of the rate changes and the options available to them. Additionally, studies have demonstrated that when consumers understand when and how much electricity they are using, they are more likely to respond to a price signal. Studies also show that consumers are more likely to respond when they have an in-home device that enables an automated response to the price change. In the past several years, the IOUs have made considerable investment developing online tools to aid customers in understanding their usage patterns and reducing their use. Simultaneously, many companies have developed automated Home Area Networks (HANs), Programmable Thermostats, or Programmable Communicating Thermostats (PCTs) that enable consumers to more easily respond to dynamic and time-variant rates. Staff proposes that the best method to bridge automated technologies, existing online tools, and new TOU and CPP rates for consumers is through marketing, education and outreach campaigns, as well as select pilots during the transition period from 2015 to 2018.

Communication, education and outreach should meet the following minimum criteria. It should be integrated with other relevant energy efficiency or demand response opportunities that are available to customers. Any messaging that is done statewide should be done through the statewide marketing campaign. There should be clear and demonstrable efforts to communicate with hard to reach customers. Efforts should be tracked and evaluated for their effectiveness against clear performance metrics. Pilots must focus on areas where learning is still needed prior to large scale implementation of the TOU rate, particularly in the area of adoption and use of automated technologies.

## GHG Costs Should be Embedded in Residential Rates

Energy Division recommends including IOU Greenhouse Gas (GHG) Cap-and-Trade-related costs in residential rates so that residential customers would begin to see a GHG price signal starting in 2015. The GHG costs should be added on an equal cents per kilowatt hour (kWh) basis to all tiers. With passage of AB 327, the restrictions on increasing Tiers 1 and 2 are removed; therefore, the IOU Cap-and-Trade program costs can be embedded in residential rates on a volumetric basis without creating disproportionate rate impacts on upper tier rates. Therefore, it is no longer necessary for the Commission to neutralize greenhouse gas costs in all residential rates. Such a decision is very consistent with rate design principles 3 (cost causation) and 9 (encouraging economically efficient decision making). The anticipated rate impact would be very modest.

## Assess Appropriate TOU Time Periods and Seasons for 2018 TOU Default

Staff believes TOU time periods and rate design need to be carefully developed in the context of GRCs, or comparable rate setting proceedings. Between now and the time of the default to TOU rates in 2018, the Commission should assess the appropriate TOU time periods and seasons that best reflect marginal costs and advance the OIR rate design principles. AB 327 directs the Commission to strive to adopt time periods for TOU rates that are appropriate for 5 years. Some of the questions and issues the Commission will need to consider when updating TOU time periods and seasons include the following:

- How steeply differentiated to make the peak to off-peak and semi-peak to off-peak ratios;
- Whether shorter or longer peak pricing periods will induce more peak demand reduction and shifting;
- Whether to have a single peak period reflecting the highest marginal energy costs in the day or two diurnal peaks (one peak reflecting the morning ramp and the other the late afternoon/evening ramp);
- Whether to include a super off-peak rate in general TOU rates to encourage off-peak EV charging or to encourage electric vehicle (EV) owners to switch to an EV-specific rate schedule;
- Whether TOU time periods and seasons should be consistent statewide for all IOUs for the purpose of coordinating outreach and education;

- How best to balance the need for technical precision around system needs with consumer comprehension and ability to take action; and
- The appropriate rate setting proceeding to address these issues in a coordinated fashion in time for 2018, and the process and frequency of subsequent changes.

## 3.2 TRANSITIONING TO A COST-BASED TOU RATE

In staff's view, the transition to a new default rate structure is nearly as important as the actual end state itself, because an excessively rapid transition to the new rate structure could result in high bill impacts, and customer confusion and frustration.

In addition, robust and well-crafted marketing campaigns to adequately prepare customers for new TOU rates and inform them about alternative rate options will be a critical component of the transition to TOU rates and this will require time to develop and implement. Accordingly, the Commission should encourage cost-effective deployment of HAN[18] devices that are proven to enhance customers' response to time-variant pricing plans.[19]

Staff recommends starting the transition with simple modifications to current rate designs. Accordingly, we offer the following specific recommendations for all three IOUs in each of the transition years.[20]

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[18] HAN devices include in-home displays (IHDs) which communicate wirelessly with the customer's SmartMeter and displays energy consumption and pricing in real-time. Another type of HAN is a programmable communicating thermostat (PCT), which in addition to the display capabilities of an IHD, also enables a customer to remotely control and program their HVAC system or enables automated control in response to price events and information. In the near future, HAN devices may have additional electric load controls.

[19] Faruqui, A., Hledik, R, Palmer, J. (2012) *Time-Varying and Dynamic Rate Design*, The Brattle Group and Regulatory Assistance, Figure 6 at pg. 32.

[20] Note that throughout the transition, consistent with the provisions of AB 327, the CARE discount must average between 30 and 35 percent of the otherwise applicable bill for SCE and SDG&E customers, which means the effective CARE discount for SCE and SDG&E will not change significantly from 2013 levels. However, staff proposes a gradual 3 percent annual reduction of PG&E's currently effective CARE discount of 47 percent until the 35 percent level is achieved. This approach would eliminate any potential rate shock to PG&E's CARE customers while bringing all three IOUs in line with statutory requirements by 2018.

### 3.2.1 TRANSITION YEAR 1 (2015)

In transition year 1, staff recommends combining current Tiers 2 and 3 into a new Tier 2 representing 101% - 200% of baseline. This would result in a 3-tier rate structure consisting of a Tier 1 rate for usage up to 100% of baseline, a Tier 2 rate for usage from 101% to 200% of baseline, and a Tier 3 rate for usage over 200% of baseline. We also recommend that the utilities offer customers optional, non-tiered, cost-based TOU and optional Critical Peak Pricing (CPP) rates in transition year 1 and throughout the transition period. These opt-in TOU and CPP rates should be revenue neutral and any resulting revenue deficiency collected from residential customers served by non-time-variant rates.[21] This adjustment is part of a convergence strategy that would ultimately lead to both TOU and tiered rates that are more reflective of true costs. In addition, PG&E's CARE discount should be decreased by 3 percent, bringing it down to 44 percent as the start of a glide path toward complying with the maximum 35% CARE discount.[22] If adopted, a minimum bill of $10 for non-CARE customers and $5 for CARE customers should be in place at this time.

Outreach and education campaigns should be initiated in 2015 to inform customers of the new rate structure as well as the changes coming in the future. The Commission should implement a series of TOU and CPP pilots that seek to understand customer responsiveness under time variant rates when combined with cost-effective deployment of HANs and other customer engagement tools and interventions.[23]

### 3.2.2 TRANSITION YEAR 2 (2016)

In transition year 2, we recommend that the default 3-tier rate structure be modified by further reducing the tier differentials. Specifically, we recommend an upward adjustment to Tier 1 and a downward adjustment to Tier 3. Opt-in TOU and CPP should continue to be encouraged, and PG&E's CARE discount should be decreased by another 3 percent, bringing it down to 41 percent.

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[21] See Section 4 for additional discussion of the technical rationale for this approach.

[22] ORA states: "The report should note that the CARE discount rate continues to change due to revenue changes, and to mitigate bill shock to CARE, the "glide path" for reducing PG&E's overall rate discount will need to take revenue changes into account." See ORA comments, January 31, 2014, p.3.

[23] A pilot program could make HANs and other enhanced customer engagement tools available to a subset of customers that opt-in to either TOU, CPP, or both. Demand responses would be compared among TVP customer with and without IHDs/enhanced customer engagement and non-TVP customers.

The TOU and CPP pilots initiated in 2015 should continue in 2016 with 1st year results being tabulated concurrently. Customers should also be made aware of the next step in the rate transition planned for 2017.

### 3.2.3 TRANSITION YEAR 3 (2017)

In transition year 3, the tiered rate structure would be collapsed to a 2-tier structure with a modest rate differential of approximately 1.3 to 1. Tier 1 would represent usage up to 100% of baseline, and Tier 2 would represent usage greater than baseline. In this, the final year before the transition to default TOU rates, the customer education campaign should be ramped up to heighten customer awareness about the approaching rate change, the ability to opt out, and customer protection tools. Opt-in TOU and CPP should continue to be promoted, and PG&E's CARE discount should be decreased by another 3 percent, bringing it down to 38 percent.

### 3.2.4 TRANSITION YEAR 4 (2018): IMPLEMENTATION OF DEFAULT TOU RATES

The transition would be complete in transition year four, with all residential customers except those with specified exclusions being defaulted to cost-based TOU rates. All customers would have the opportunity to opt out of TOU rates and choose the 2-tier rates that were introduced in transition year 3. Under this transition, customers that had not already opted into TOU will have been on the 2-tiered rate for a year, and will thus have had time to evaluate which rate structure works best for them prior to the default date. PG&E's CARE discount should be decreased by another 3 percent, bringing it down to the top of the statutory 30-35 percent range.

Customer education, cost-effective deployment of HANs, and opt-in CPP rates should be offered throughout the transition period and beyond. AB 327 does not allow the Commission order default CPP for residential customers. By offering CPP as an optional overlay to either TOU or tiered rates, customers will effectively have at least four rate options to choose from. Additionally, EV rates should continue to be offered (and related sub-metering issues addressed) and reviewed by the Commission to ensure that (1) they are consistent with the OIR rate design principles and (2) they are sending effective price signals that encourage off peak EV charging.[24]

[24] The Commission is addressing statewide EV rate design in a separate rulemaking (R.) 13-11-007.

## 3.3 PROPOSED CUSTOMER PROTECTIONS

Customer acceptance and understanding of the new rate structure and transition process will be enhanced by several important elements that are also required by AB 327:

- Vulnerable Customer TOU Exemption: AB 327 requires consent be obtained from medical baseline and third party notification customers before they are placed on default TOU. These customers may still voluntarily opt-in to any optional rate.
- Opt-Out: AB 327 requires that customers be able to opt out of default TOU onto tiered rates.
- Shadow Billing: The law requires the utilities to provide a rate comparison showing what their bill would be under alternative rates. (Currently, PG&E and SDG&E offer this tool online.) AB 327 also requires that the utilities provide a yearly summary of available tariff options and expected annual bill impacts of each of these tariffs. We recommend the Commission require these summaries to clearly show which rate plan results in the lowest and highest bill for customers based on their usage history.
- Bill Protection: The law also requires one year of bill protection, ensuring that a customer's bill will be no higher than it would have been under that customer's previous rate schedule. Staff further recommends that bill protection continue to be offered to customers who opt-in to CPP for their first 12 months on a CPP tariff. When a customer simultaneously elects to be on both TOU and CPP, bill protection should also apply.

### 3.3.1 FERA AND MEDICAL BASELINE

Staff recommends that the Commission retain important rate affordability protections while it examines potential ways to provide more targeted assistance to those with greater financial needs.

- The Commission should retain Family Electric Rate Assistance (FERA) and Medical Baseline protections, but these protections should be implemented consistent with the revised statutory constraints that the

CARE discount must fall between 30 and 35 percent (and PG&E's discount should be reduced to this range in a reasonable timeframe).

- The FERA program provides electricity at the tier 2 rate for consumption up to 200% of Baseline Quantity (i.e. for tier 3 usage). The program is available to families of three or more with annual incomes up to 250% of the federal poverty level. The transition to a 2 tier rate structure would impact the FERA program. With the elimination of Tier 3, a FERA-qualifying customer would be billed for consumption above 200% of baseline at the Tier 2 rate just like all other customers. The Commission will need to determine the basis for providing a rate discount to FERA customers under a 2 tier rate structure as well as under optional and default un-tiered TOU rates. Given the movement away from tiers in this proposal, staff recommends that the new FERA program be modeled as a "CARE lite" program with a level of discount identified through a needs assessment. The method of discount could be similar to the CARE method eventually adopted by the Commission (see CARE options under Recommendation 5 and Section 6. During Phase 1 of this proceeding, there was almost no record developed on how to implement FERA under a 2-tier rate structure. The future form of the FERA program should be determined in a future phase of this proceeding.

## 3.4 COORDINATION WITH THE NET ENERGY METERING (NEM) PROCEEDING

Compared to today's rates, the cost-based TOU rate design we propose appropriately supports the development of NEM facilities, provides reasonable value to existing NEM facilities, and reduces the cost born by non-participants. Given the level of cross-subsidy that NEM represents today[25], any cost-based rate design is likely to reduce the current level of support provided to NEM through the rate structure. The ideal rate structure for NEM customers may not be the ideal rate structure for the majority of non-NEM customers. The goal of promoting customer-sited distributed generation is important, but we believe, in accord with rate design principles 2, 3, 8 and 9, that rates should generally reflect costs and that to the extent subsidies are required to continue incentivizing customer adoption of DG, the subsidies should be explicit and transparent.

[25] "California Net Metering Ratepayer Impact Evaluation", CPUC, October, 2013.

Staff agrees with parties who argue that reducing the number of tiers or flattening tier differentials will reduce some of the economic value of NEM facilities to participants. On the other hand, there are likely to be current non-participants who would like to "go solar," but cannot justify doing so based on the below-cost rate they are paying for their Tier 1 and 2 usage. For this latter group of customers, the economics of distributed energy would improve if the current rate structure were replaced with a non-tiered TOU rate or the number of tiers was reduced and the tier differentials flattened. In the ratesetting process that determines the transitional and end-state new rate structures, the Commission should continue to consider the impact of the new rate structure on the ongoing value of NEM facilities for existing NEM customers. This should be done in coordination with the NEM transition and future NEM policy proceedings. The Commission should consider such impacts in balance with other competing Commission policy objectives.

## 3.5 HIGHLIGHTS OF ILLUSTRATIVE TRANSITIONAL AND END-STATE RATES FOR ENERGY DIVISION STAFF PROPOSAL AND BILL IMPACTS GENERATED FROM UTILITY MODELS[26]

### 3.5.1 OVERVIEW OF METHODS AND ASSUMPTIONS

Staff utilized PG&E's and SCE's bill impact models developed for this proceeding[27] to generate illustrative rates and associated bill impacts for Non-CARE and CARE customers for three proposed rate design scenarios described in Section 3.1 and 3.2:

- 2015 transitional default 3-tier
- 2018 end-state default un-tiered TOU
- 2018 end-state optional 2-tier

Since the PG&E and SCE models utilize marginal costs and cost allocation factors, billing determinants, and TOU periods from current or recent GRCs to generate proposed rates, they are illustrative rather than predictive.[28] Illustrative bill impacts are

[26] A detailed discussion of illustrative rates and bill impacts is found in Appendix A.

[27] Since the SDG&E model only allowed users to apply on-peak, part-peak and off-peak ratios and CARE discounts to the commodity rate rather than the total rate, staff opted not to utilize the SDG&E model to generate illustrative rates and bill impacts.

[28] Illustrative rates and bill impacts are based on model inputs (i.e., billing determinants, revenue requirements, and marginal costs) utilized to generate 2012 PG&E or 2012 SCE GRC rates. In order to

defined as the change in the customer's bill relative to the current residential default non-TOU four-tiered inclining block rate design and can be measured as either the percent difference, expressed in percent (%), or the absolute difference, expressed in dollars ($), between baseline and proposed customer bills. The methods and assumptions, and resulting bill impacts, are discussed in greater detail in Appendix A.

### 3.5.2 ILLUSTRATIVE TRANSITIONAL AND END-STATE RATES FOR ENERGY DIVISION STAFF PROPOSAL

For purposes of the illustrative rates developed through the IOU bill calculator models, the rates below include a $5 minimum bill ($3.3 for CARE). The number of tiers and tier differentials corresponds to the proposal description in Section 3.1 and 3.2. The peak to off-peak ratios are approximately 2.5 for peak and 1.5 for semi-peak. Table 3-1 below provides a summary of the transitional and end-state illustrative rates proposed by staff.

**Table 3-1 Illustrative 2015 Transitional and 2018 End-State IOU Electric Rates**

| | Transitional Default 3-Tier 2015 | | | End-State Default TOU 2018 | | | | | End-State Optional 2-Tier 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Non-CARE | Tier 1 | Tier 2 | Tier 3 | Summer On Peak | Summer Part Peak | Summer Off Peak | Winter Part Peak | Winter Off Peak | Tier 1 | Tier 2 |
| PG&E | 14.1 | 21.2 | 30.6 | 36.8 | 22.0 | 14.7 | 17.6 | 14.7 | 17.0 | 20.4 |
| SCE | 14.9 | 22.4 | 29.3 | 40.6 | 24.3 | 16.2 | 21.0 | 14.0 | 17.9 | 21.5 |
| CARE | Tier 1 | Tier 2 | Tier 3 | Summer On Peak | Summer Part Peak | Summer Off Peak | Winter Part Peak | Winter Off Peak | Tier 1 | Tier 2 |
| PG&E | 8.8 | 13.1 | 19.0 | 23.5 | 14.1 | 9.4 | 11.3 | 9.4 | 11.2 | 13.5 |
| SCE | 8.8 | 13.7 | 18.1 | 25.5 | 14.9 | 9.7 | 12.8 | 8.2 | 10.8 | 13.1 |

### 3.5.3 BILL IMPACTS GENERATED FROM UTILITY BILL CALCULATOR MODELS FOR ENERGY DIVISION STAFF PROPOSAL

Staff emphasizes that customers' transition to future rate designs will occur over multiple years. Therefore, the illustrative model results do not represent average annual rate and bill impacts but rather total rate and bill impacts if a customer were to switch to an alternative rate design (i.e., 3-tier, 2-tier or TOU rate design). Because of this limitation in the models, the bill impacts appear overstated if viewed as a transition in a single year. We were not able to model year by year changes for multiple years.

predict actual rates and bill impacts in future timeframes, the most current costs, revenues, and load forecasts will need to be utilized in GRC models.

Therefore, the illustrative impacts shown would occur over 3 years from 2012 to 2015 for the 3-tier transitional rate and over 6 years from 2012 to 2018 for the end-state rates.

**Summary of Results**

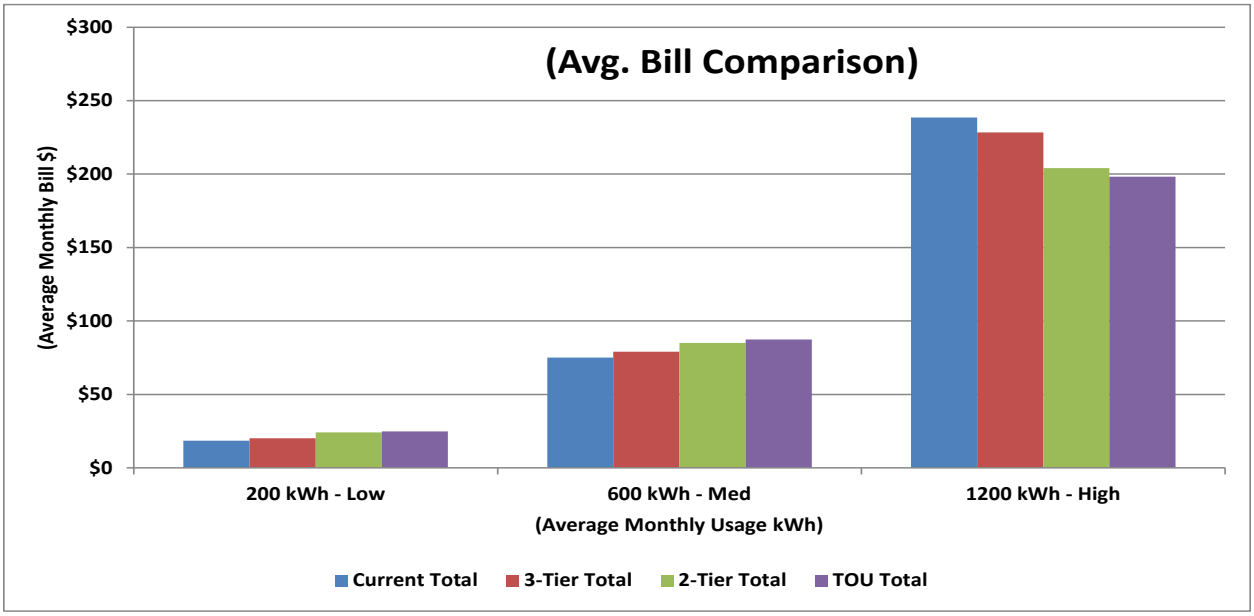
The overall trend is that low and medium consumers see modest bill increases while large consumers see modest bill decreases. This result is not surprising for several reasons. For PG&E 72%, and for SCE 78%, of energy sales occur in Tier 1 and 2 rates which are sold at below cost. Raising the lower tier rates closer to cost-based levels results in modest bill increases for low and medium consumers, and modest bill reductions for upper tier and higher consumption customers. For detailed bill impact analysis of each scenario for PG&E and SCE refer to Appendix A.

**Bill Impact vs. Average Monthly Usage**

Figures 3-1 and 3-2, and Tables 3-2 and 3-3, illustrate average monthly bills in 2012 dollars for all PG&E and SCE low (200 kWh), medium (600 kWh) and high (1200 kWh) usage customers subscribed to current (2012) transitional default 3-tier and end-state optional 2-tier or end-state default TOU rates.[29] These figures demonstrate how modest the bill impacts of the staff proposed illustrative rates are. To cite just one example, a medium PG&E customer would see a $3.95 monthly increase or average of 5% per year by 2015 under the transitional default 3-tier rate. By 2018, that same customer would see a $12.38 monthly increase or average of 16% per year when defaulting to TOU. If they made no change to their consumption pattern they would be slightly better off if they opted out onto the 2-tier rate in which case their monthly bill would only go up $9.99 per month or 13%. However, just a modest shift in their usage away from peak demand would make the TOU rate their lower cost option. All of this analysis would be presented to them in their annual rate comparison and be available on-demand online through their utility's website or accessible from a customer service representative. Finally, with bill protection for the first year, they could remain on TOU with the assurance that their bill could not be higher than their bill would have been on their previous rate schedule. Bear in mind that the impacts of the 2015 transitional rates would occur over 3 years compared to 2012 rates and the impacts of the 2018 end-state rates would occur over 6 years.

[29] Results present monthly average % and $ bill impacts for all customers (i.e., non-CARE and CARE customers) with either low, medium or high usage.

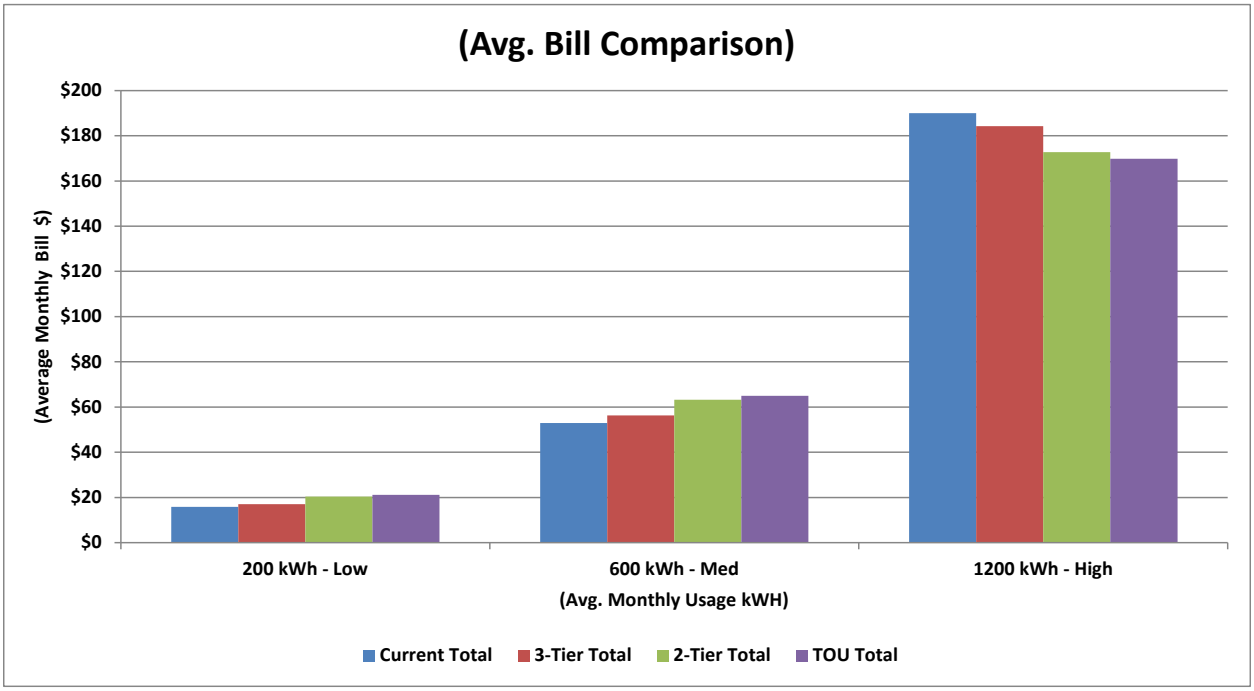
## Figure 3-1 $ Bill Impact vs. Average Monthly Usage – PG&E Customers




## Table 3-2 $ Bill Impact vs. Average Monthly Usage – PG&E Customers

| Avg. Usage @ | 2012 Total | 3-Tier Total | Δ dollars from 2012 | Δ percent from 2012 | 2-Tier Total | Δ dollars from 2012 | Δ percent from 2012 | TOU Total | Δ dollars from 2012 | Δ percent from 2012 |
|---|---|---|---|---|---|---|---|---|---|---|
| 200 kWh - Low | $18.42 | $20.09 | $1.67 | 9% | $24.21 | $5.79 | 31% | $24.80 | $6.38 | 35% |
| 600 kWh - Med | $75.05 | $79.00 | $3.95 | 5% | $85.04 | $9.99 | 13% | $87.43 | $12.38 | 16% |
| 1200 kWh - High | $238.50 | $228.29 | -$10.21 | -4% | $204.03 | -$34.47 | -14% | $198.27 | -$40.23 | -17% |

## Figure 3-2 $ Bill Impact vs. Average Monthly Usage –SCE Customers




## Table 3-3 $ Bill Impact vs. Average Monthly Usage – SCE Customers

| Avg. Usage @ | 2012 Total | 3-Tier Total | Δ dollars from 2012 | Δ percent from 2012 | 2-Tier Total | Δ dollars from 2012 | Δ percent from 2012 | TOU Total | Δ dollars from 2012 | Δ percent from 2012 |
|---|---|---|---|---|---|---|---|---|---|---|
| 200 kWh - Low | $15.85 | $17.05 | $1.20 | 8% | $20.42 | $4.57 | 29% | $21.15 | $5.30 | 33% |
| 600 kWh - Med | $52.91 | $56.32 | $3.41 | 6% | $63.20 | $10.29 | 19% | $65.01 | $12.10 | 23% |
| 1200 kWh - High | $190.00 | $184.21 | -$5.79 | -3% | $172.71 | -$17.29 | -9% | $169.78 | -$20.22 | -11% |

### Energy Conservation and Peak Load Shifting Effect of Illustrative Rates

The impacts generated in the utility bill calculator models are static. The models assume the same billing determinants when comparing present to modeled rates and thus do not reflect any change in consumption resulting from the alternative rates. PG&E developed an "Energy Conservation Tab" in its model using a basic elasticity of demand sidebar tool[30] which allows the user to see the change in consumption between two sets of end-state rates compared to present rates based on user-defined elasticity

[30] See PG&E Bill Impact Model User Guide Appendix F "Conservation Tab."

inputs.[31] These results can only be seen outside of the main model. PG&E defined price elasticity as -0.20% based on the often sited estimate of elasticity developed by Faruqui's "meta-analysis" of dynamic pricing studies.[32]

Based on the results of the PG&E model, staff found that its end-state TOU rate leads to a 3.4% overall reduction in consumption and the end-state 2 tier rates leads to 3.2% conservation. In addition, the TOU rate reduces peak demand by 12% and reduces semi-peak demand by 3%. If these results were factored into the bill impacts then two important additional benefits would be observed:

- Overall bill impacts would be lower across the board for customers.
- The TOU rate would lead to lower overall system cost.

### Table 3-4 PG&E Customer Energy Consumption Change – 2-Tiered & TOU Rate Designs

| Total Energy Conservation | 2-Tier | TOU |
|---|---|---|
| % Annual Energy Conserved | 3.20% | 3.40% |

### Table 3-5 PG&E Customer Energy Consumption Change – TOU Period & Season

| Energy Consumption Change By TOU Period and Season | Non-CARE | CARE |
|---|---|---|
| % Energy Consumption Change Summer On-Peak | -12% | -12% |
| % Energy Consumption Change Summer Part-Peak | -3% | -3% |
| % Energy Consumption Change Summer Off-Peak | 5% | 5% |
| | | |
| % Energy Consumption Change Winter Part-Peak | -3% | -3% |
| % Energy Consumption Change Winter Off-Peak | 1% | 1% |

According to Table 3-4, illustrative PG&E 2-tiered and TOU rate designs promote a modest degree of energy consumption change. However, PG&E TOU rate design model results also indicate that 12% of non-CARE and CARE customer usage is reduced during the summer on-peak period. In addition, a modest degree of energy reduction (3%) is observed during both the summer and winter part-peak periods. Thus while overall conservation is comparable under either end-state rate, conservation under the TOU rate is expected to occur when it is most valuable.

[31] In comments, SCE states that its model similarly allows users to input desired levels of elasticity. See, SCE comments filed January 31, 2014, at 2.

[32] "A Meta-Analysis of Dynamic Pricing Studies- Some Initial Findings", by Ahmad Faruqui, Sanem Sergici, and Eric Shultz, Brattle Group, 2012.

### Comparison of Staff Proposed Illustrative Rates to Other Parties' Proposals

Several of the parties generated illustrative rate proposals. A comparison of these proposals can be seen in Appendix B.

# 4 DISCUSSION OF ALTERNATIVE RATE DESIGN ELEMENTS

## 4.1 OVERVIEW OF PARTY RATE DESIGN PROPOSALS

A March 19, 2013 ALJ ruling invited parties to submit rate design proposals that best achieve the Commission's ten rate design principles. A total of fifteen different rate design proposals were submitted by parties. In terms of the proposed default end-state rate structure the proposals generally fell into the following categories:

- **Tiered Flat Rates** – Five proposals (PG&E, SCE, The Utility Reform Network (TURN), Center for Accessible Technology (CforAT)/The Greenlining Institute (Greenlining Institute), and San Diego Consumers' Action Network (SDCAN)
- **Time-of-Use Tiered Rates** – Four proposals (Office of Ratepayer Advocates (ORA), Natural Resources Defense Council (NRDC), Solar Energy Industries Association (SEIA)/Vote Solar, and Sierra Club)[33]
- **Time-of-Use Non-Tiered Rates** – Four proposals (SDG&E, Environmental Defense Fund (EDF), California Large Energy Consumers Association (CLECA), and Consumer Federation of California (CFC)).
- **Other Concepts** – Two parties submitted "conceptual" proposals that were not full rate design proposals. The proposal of Interstate Renewable Energy Council, Inc. (IREC) introduced a potential new framework for a "Clean CARE" program, and Distributed Energy Consumer Advocates (DECA) introduced what it calls "Credit for Responsive Energy Distribution Infrastructure and Timing" (CREDIT).

At a high level, several conclusions can be drawn about the views of the parties that submitted rate design proposals and the parties that submitted rate design comments:

- Most parties believe that the current increasing block rate design is not sustainable and needs to be reformed.
- Many parties believe that the adoption of TOU rates is a reasonable and cost-effective method to reduce peak period usage, lower overall cost of service, encourage conservation, and encourage adoption of

[33] NRDC's default end-state rate design proposal was a hybrid: large load customers with > 7 kw demand would have tiered TOU rates, while small load customers would have inclining block tiered rates.

innovative GHG-reducing technologies. The majority of proposals (eight of the thirteen full rate design proposals) include some form of TOU default, with the ability to opt out to a non-time variant rate structure.

- A large majority of the parties (nine of thirteen) support some form of baseline quantity.
- The majority of parties believe that adoption of optional dynamic pricing rates is a reasonable and cost-effective way to achieve peak energy reduction on critical demand days and lower system costs. Many propose dynamic rates as an opt-in overlay to the default rate, or do not oppose CPP as long as it remains voluntary.

- A large majority of parties oppose the use of fixed charges in residential rates, and only one party (SDG&E) expressly proposes the use of a residential demand charge.
    - Regardless of the adopted rate design, all parties agree that educating customers and providing a gradual transition to facilitate customer understanding and minimize potential bill impacts is a priority. The majority of parties believe the deployment of IHDs will enhance customers' load response to time-variant pricing plans (default or opt in). [34]
    - All parties agree that "vulnerable" customers, including CARE and Medical Baseline customers, must be protected, and that access to these rate protections should be determined based on a needs assessment. Some parties believe new and innovative ways of subsidizing the energy needs of these customer groups should be explored.

[34] SDCAN stressed "the impact of rate design reforms upon device retailers and/or the third-party aggregators who, if enticed into the California markets, will play a major role in educating customers and effecting the adoption to real-time rates." And SDCAN stated: "SDCAN's basic thesis advanced in this submission is that the innovative technologies and services are the linchpin to residential adoption of real-time pricing." Further, SDCAN proposes "pegging the rate reform transition upon the emergence of an energy-management marketplace that would allow residential customers to utilize the rate structures." SDCAN Rate Design Proposal (May 29, 2013), p. 3-5, 11-14, 17-22.

## 4.2 DISCUSSION OF TOU AND TIERED RATE PROPOSALS

### 4.2.1.1 OVERVIEW OF TOU PROPOSALS

Eight of the thirteen full rate design proposals support transitioning to default TOU rates as the preferred end-state rate of the future. TOU proposals from ORA, SEIA/Vote Solar Parties, NRDC, and Sierra Club all also included either tiers or baseline credits. For example, ORA proposes default TOU with a $0.05 per kWh baseline credit. Optically, this would appear like a non-tiered TOU rate to the customer who would see a line item credit on their bill, but the rate would function like a two-tier TOU rate. An illustration of this presentment for ORA's proposed illustrative end-state TOU rate for PG&E[35] is below:

**Table 4-1 ORA's PG&E TOU Rate With a Baseline Credit**

| Summer Period | | | Winter Period | |
|---|---|---|---|---|
| On-Peak | Shoulder-Peak | Off-Peak | Shoulder-Peak | Off-Peak |
| 40.2 | 28.7 | 16.9 | 28.7 | 16.9 |
| Baseline Credit = 5.0 cents/kWh | | | | |

All TOU proposals except CLECA's allow customers to opt out of the default TOU rate to a non-time-variant pricing tariff, such as tiered flat rates. CLECA's proposal calls for cost-based default TOU with an optional dynamic pricing overlay.[36] The customer can opt out of TOU rates onto flat un-tiered rates with a dynamic pricing overlay. SDG&E's proposal would include a flat rate option with a premium in addition to the TOU structure: "An added premium to the flat rate is necessary given that the flat rate option does not reflect marginal cost or cost-causation."[37]

A comparison of the TOU rate proposals is provided in the table below.

[35] ORA Proposal at 43.

[36] Consisting of either CPP or real-time pricing (RTP)

[37] SDG&E Proposal at 23.

### Table 4-2 Comparison of Proposed Default TOU Rate Structures

| Party | Proposal |
|---|---|
| SDG&E | Default non-tiered TOU rates with a non-coincident peak demand charge and TOU commodity charges. As an alternative, could use demand-differentiated basic service fee.<br><br>Transition: Gradual steps, timing TBD in GRC process. |
| EDF | Default non-tiered TOU rates with opt-out to inclining block tiered structure. Oppose unavoidable fixed customer or demand charges. Support fees for services, including minimum bill associated with specific minimum services from IOU. Minimize time windows for peak price; maximize super-off peak time windows; align with diurnal changes in costs and modify at least as regularly as GRCs. Peak- 4pm-7pm; Off Peak-4am-4pm; 7pm-midnight; Super Off Peak: Midnight-4am<br><br>Transition: 1-3 years with bill protection with limiters and shadow billing. |
| CLECA | Default non-tiered TOU rates with $5/month fixed charge and optional dynamic pricing rates; third party notification customers and medical needs customers exempt from default TOU.<br><br>Transition: Approximately 4-5 years. Shadow billing made available at least two years prior to the default to TOU rates. |
| CFC | Default non-tiered TOU rates with optional RTP and CPP overlay. Allow opt out to current inverted tiered rate structure. Three summer pricing periods: peak, semi-peak, & off peak. Two winter periods: semi-peak & off peak.<br><br>Transition: 3-5 years with bill protection for all TOU, RTP, and CPP rates. |
| ORA | Default TOU rates with 5 cent/kWh baseline credit and opt out to inclining 2-tiered structure.<br><br>Transition: default "Introductory TOU" rate would be inclining 3-tiered rate with on-peak surcharge and off-peak credit. Customers may opt out of the interim TOU rate to the same tiered structure without TOU overlays. $5 minimum bill in lieu of fixed charge. Gradually reduce tier differentials and number of tiers until default TOU rate is fully cost-based. |
| SEIA/Vote | Default TOU rates with two-tier baseline credit and opt out to inclining |

| | |
|---|---|
| Solar | 3-tiered rate. No customer or demand charges or minimum bills. Existing TOU period definitions, with differences in TOU rates similar to current residential TOU rates.<br><br>Transition: During 6-year transition, current default tiered rate structure is gradually modified until the TOU default occurs. The end-state TOU rate is available as an opt-in rate during the transition. The current tiered structure is gradually modified to arrive at the end-state opt-out 3-tier rate structure. |
| NRDC | Default TOU for customers with > 7 kW demand, with surcharge for use between 101 to 200% of baseline and a higher surcharge for use above 200% of baseline. No fixed or demand charges. Lower usage customers would default to an inclining 3-tiered structure, and could opt in to TOU rates.<br><br>Transition: Large customers see gradually increasing bill limiter over 5 years; small customers see gradually changing tier prices over 7 years. |
| Sierra Club | Combination of tiers and TOU (three TOU periods with three tiers). 10 cent peak surcharge, 3 cent part-peak surcharge, 5 cent off-peak credit. Apply various discount percentages to non-CARE rates for each tier and TOU adders to amount to same discount as current CARE program. No fixed or demand charges.<br><br>Transition: TBD |

The primary arguments identified by staff and parties in favor of TOU rates include:

1) TOU rates provide price signals that encourage customers to lower their bills through peak load shifting and reductions. [See discussion of Principles #4 and #5]
2) TOU rates encourage customer behavior changes and adoption of energy management technologies that lower overall electric system costs and benefit the environment. [This argument is explored in the discussion of Principles #4 and #5]
3) TOU rates reflect cost causation and marginal cost. [This argument is explored in the discussion of Principles #2 and #3]
4) TOU rates are easier to understand than inclining block rates. [This argument is explored in the discussion of Principle #6]

5) TOU rates provide customer choice to better control their energy bills. [This argument is explored in the discussion of Principles #6 and #10]

The main arguments against TOU rates identified by staff and parties include:

1) TOU rates adversely impact low-income customers with less discretionary load to shift. [This argument is explored in the discussion of Principle #1]
2) The conservation benefits of TOU rates may be overstated. [This argument is explored in the discussion of Principles #4 and #5]
3) TOU rates are harder to understand than inclining block rates. [This argument is explored in the discussion of Principle #6]

#### 4.2.1.2 OVERVIEW OF TIERED RATE PROPOSALS

Most of the parties that propose some form of tiered end-state rates acknowledge that the current tiered rate structure may not be sustainable. "TURN agrees that the present rate design, with such large and uneven tier differentials, may not be sustainable if average rates continue to rise in excess of inflation."[38] Similarly, PG&E states "The current residential electric rate structure in California is broken. …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."[39] These parties continue to favor tiered rates, but with various reforms.

Five of thirteen parties proposed tiered rates[40] as the preferred end-state rate (PG&E, SCE, TURN, CforAT/Greenlining Institute, and SDCAN), as follows:

- The SCE and PG&E proposals include a 2-tier end-state default rate with a modest ratio between tier 2 and tier 1. Both proposals modify the current tiered rate structure by gradually reducing the number of tiers from four to three and reducing the tier differentials as a transition to the 2-tier end state rate.

[38] Residential Rate Design Proposal of The Utility Reform Network, 5/29/13, at 3.

[39] Rate Design Reform Proposal of Pacific Gas and Electric Company, 5/29/13, at 1.

[40] "Tiered rates" is used herein to refer to *inclining* block tiered rates.

- TURN proposes a 3-tier end state that is similar to SCE's transitional 3-tier rates with the significant difference that both IOUs include fixed customer charges while the non-IOU proposals do not.
- CforAT/Greenlining propose a 3-tier rate structure, but also include high consumption surcharges for usage in excess of 400 percent and 600 percent of baseline usage as "an express incentive to encourage conservation".[41]
- Finally, SDCAN proposes retaining the current 4-tier structure and "extending" (increasing) the tier differentials.

The primary arguments staff and parties identify for tiered rates include:

1) Lower tiers ensure affordability of basic quantities of electricity.
2) Tiered rates benefit low-income customers.
3) Upper tiers encourage conservation and energy efficiency.
4) Upper tier prices encourage customers to install on-site distributed generation.
5) Tiered rates are easy to understand: "the more you use the more you pay."
6) Tiered rates reflect cost-causation, since upper-tier usage is correlated with higher on-peak usage.

The main arguments staff and parties identify against tiered rates include:

1) Above-cost upper tier rates hurt low-income non-CARE high-use customers.
2) Below-cost lower tiers, while helping subsidize low-income households, also unnecessarily subsidize many middle and upper income households.
3) The conservation encouraged by upper-tier rates is offset by the over-consumption induced by lower-tier rates. The energy efficiency claims are only theoretical and very little empirical evidence exists to support the theory.

[41] In comments, CforAT/Greenlining states that this Report mischaracterizes their proposal: "The CforAT/Greenlining Proposal sets out the concept of a surcharge to be assessed for consumption at a rate that exceeds 400% of baseline and an increased surcharge for consumption at a rate that exceeds 600% of baseline. The proposal does not address whether the surcharge should be assessed as a flat charge or a volumetric charge; either could potentially serve as an express incentive for conservation among customers whose usage is extremely high. See CforAT/Greenlining comments, January 31, 2014, p.2.

4) High upper tier prices encourage upper tier users to install uneconomic on-site distributed generation, shifting costs to other customers.
5) Most customers do not understand tiered rates and are not aware of when they cross into the higher tiers.
6) Tiered rates reflect neither cost causation nor marginal costs, and are therefore not efficient.

Staff agrees with those parties who acknowledge that the existing tiered rate structure is in need of reform to alleviate well documented distortions, inequities, and unintended consequences. The analysis that follows evaluates TOU versus tiered rate structures in the context of the Commission's ten rate design principles. Where applicable, we examine the specifics of various proposals submitted by parties.

#### 4.2.1.3 CONFORMANCE OF TOU AND TIERED RATES WITH RATE DESIGN PRINCIPLES

This section discusses pros and cons of TOU versus tiered rates based on parties' rate design proposals and additional research and analysis performed by staff. Information provided in this section informed the staff proposal's recommended TOU end state as well as the staff proposal for transitional default 3-tiered rates and end-state opt-out 2 tier rates.

##### 1. LOW-INCOME AND MEDICAL BASELINE CUSTOMERS SHOULD HAVE ACCESS TO ENOUGH ELECTRICITY TO ENSURE BASIC NEEDS (SUCH AS HEALTH AND COMFORT) ARE MET AT AN AFFORDABLE COST.

Historically, this principle has been achieved through targeted assistance programs such as CARE and FERA. These programs will be retained under any rate design and AB 327 requires that the CARE discount be set within the range of 30-35%.[42] Therefore, we focus here on the question of the income effects of TOU rates and whether TOU rates hurt or help low-income and medical baseline customers. We find little evidence that low-income customers are harmed by TOU rates and we find that they have the potential to benefit from TOU rates. Given the fact that any defaulted customer can opt out to a two-tier rate, we are not necessarily attempting to "settle" the TOU vs. tiered rate debate, even as we offer our own detailed perspective. Customers would retain the choice between a default cost-based TOU rate and a 2-tier opt-out rate.

[42] Evaluation of proposals to modify the CARE program are discussed in Section 6.

AB 327 includes several provisions that relate to time-variant pricing (TVP) rates:

- IOUs may not default customers to TVP rates prior to January 1, 2018.
- Customers may opt out of TVP rates to a non-TVP rate with at least two tiers.
- Defaulted customers must have one year of bill protection beginning in the first year of the default.
- Each customer must receive an annual "rate comparison" that shows the bill impacts of all available tariffs.

### A. PROTECTING LOW INCOME AND SPECIAL NEEDS CUSTOMERS

Staff believes that TOU rates will not harm low-income and special needs customers thanks to vulnerable customer exemptions, customer-friendly opt-out provisions, and a well-designed and implemented education campaign. In fact, many low-income customers stand to benefit from TOU and dynamic rates.

All of the TOU rate proposals would exempt medical baseline and third party notification[43] customers from default TOU due to concerns of possible adverse consequences for this limited group of special needs customers. AB 327 requires this as well. These types of customers may be operating medical and life support equipment continuously, may be home more during peak hours, and may require air conditioning to maintain their health.

Several parties (e.g., CforAT/Greenlining and TURN) are opposed to default TOU based on its potential to harm vulnerable and low-income customers on affordability grounds. According to TURN, vulnerable customers who have to stay at home (i.e., senior citizens) and rely on air conditioning to survive during hot summer months could face significantly higher bills.[44] A similar view is offered by CforAT/Greenlining, which are concerned that TOU rates would harm "vulnerable customers who are homebound and forced to use heating or cooling during peak periods to maintain comfort and safety."[45] These joint parties propose that vulnerable customers be educated about the potential

[43] Third party notification is described in Public Utilities Code section 779.1(c) as a service for seniors, who are dependent adults. Under this program, the IOU attempt to notify a person designated by the customer to receive notification when the customer's account is past due and subject to termination.

[44] TURN Proposal at 41.

[45] CforAT/Greenlining Proposal at v.

impacts of TOU rates based on their circumstances and be given opportunities to avoid such impacts.[46]

NRDC favors default TOU, but with an exemption for low-use (<7 kW) customers. Parties such as CforAT/Greenlining share NRDC's contention that low-usage and/or low-income customers do not have the discretionary loads (such as air conditioning) to shift out of peak usage.[47] NRDC also asserts that apartment loads are dominated by lighting, refrigeration, and appliances, which seems to imply that apartments are less likely to have air conditioning (AC). NRDC believes that small loads are less demand responsive due to lower AC saturation.[48]

However, the data suggests that AC saturation is far more pervasive across all types of customers and thus even smaller loads do have some discretionary load. In its Residential Appliance Saturation Survey (RASS),[49] the CEC finds that over 90 percent of households in California's hotter climate zones have AC, AC saturation for apartment dwellers is only slightly lower than single family homes, and mobile homes actually have a higher saturation. Using NRDC's AC proxy for flexible loads, this data suggests that that most households in hotter climate zones have flexible loads. NRDC's proposed 7 kW cut-off for default TOU would exclude most multi-family units with AC and some smaller single-family units. NRDC provides no rationale for exempting smaller households with smaller AC units from default TOU, whose occupants are presumably just as capable of being flexible with their demand for AC as the occupants of larger households.

Thus, staff does not view default TOU as potentially harmful to smaller households, though we recognize the need for adequate consumer protections to mitigate billing impacts and other unforeseen consequences. Staff believes that customer-friendly opt-out provisions and a well-designed and implemented education campaign could address these concerns.

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[46] *Id*.

[47] *See* CforAT/Greenlining Proposal at 44, and Reply Comments at 8; *See* NRDC proposal at 5.

[48] NRDC Proposal at 11.

[49] 2009 California Residential Appliance Saturation Study, Prepared for the CEC by KEMA, pp. 22-24.

### B. CORRELATION BETWEEN INCOME AND USAGE

In staff's opinion, the correlation of income with usage is not strong enough to support the generalized argument that low-income households are harmed by default TOU. Further, we note that studies referenced below indicate that many low-income households stand to benefit from a TOU rate. Consequently, staff believes that the various protections mandated by AB 327 are the preferable method to protect households from the potential to be harmed by a default TOU rate.

Staff acknowledges that there is a lot of debate regarding whether there is a robust correlation between income and consumption. Parties who believe that higher income is closely correlated with higher consumption also believe that cost-based TOU rates are unfair to low consumption (i.e., lower income) households who benefit from low-tier below cost rates. Cost-based TOU would raise rates for low-tier users regardless of income.

According to the CEC's Residential Appliance Saturation Study, electricity and natural gas use increase with income level in the state, as shown in Figure 6.[50] However, the study also concludes that despite the positive correlation between electricity use and income, all levels of electricity use are observed at every income level.[51] For instance, 8 percent of the low income households are categorized as high energy users (over 8,350 kWh per year), whereas 11 percent of high-income households are low energy users (less than 3,360 kWh per year). Given the imperfect income-consumption correlation, some low-income low-use customers would see a bill increase from the shift to cost-based TOU, while some low-income high-use customers would see a bill decrease.

[50] The chart provided shows the relationship between average electricity use per household and income groupings. Source

[51] Ibid at 2-3.

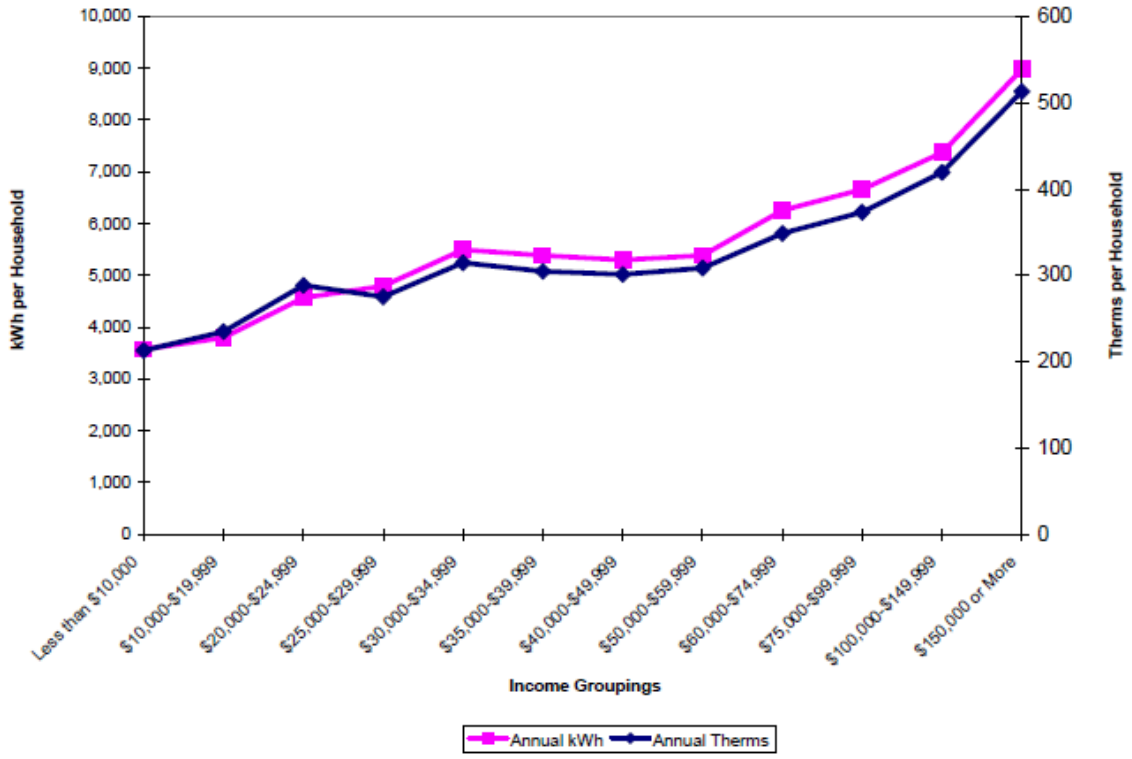


**Figure 4-1 Average Electricity and Natural Gas Consumption by Income**
**Source: KEMA (2010), p. 32.**

On the other side of the income-effect argument, most parties that support default TOU rates believe they have no adverse impacts on customers based on income and many believe that TOU is beneficial to almost all customers because it provides the ability to shift usage to lower cost periods. CLECA asserts that "TOU rates have no adverse impacts by income and there is no evidence that some customers have no ability to shift their usage to a different time period with the possible exception of medical needs customers."[52] To support its contention, CLECA cites a 2012 Borenstein study that concludes that low-income consumers are similarly "peaky" in their usage compared to other customers.[53]

[52] CLECA Opening Comments at 3.

[53] Borenstein, Severin (2012). *Effective and Equitable Adoption of Opt-In Residential Dynamic Electricity Pricing*, Working Paper 229, Energy Institute at Haas, University of California at Berkeley.

Several parties argue that TOU and CPP rates offer low-income households significant opportunities to save. EDF cites a study[54] in which nearly 80 percent of low-income customers presented with a CPP rate experienced bill reductions without significant changes to their behavior and the percentage rises to more than 90 percent "winners" after households responded to the rate. EDF also notes that in PG&E territory CARE customers use 5% more energy than non-CARE customers.[55] In addition, EDF argues that this higher consumption is due to a variety of factors, including a price signal that encourages high consumption, older less efficient appliances, split incentives between landlords and renters, and lack of information:

> *While low-income households on the CARE rate have access to utility energy efficiency programs, their incentive to adopt offered measures – even if they're free – is muted by the CARE subsidy itself…Instead, the subsidy encourages continued reliance on inefficient appliances and behaviors.*[56]

CFC supports default TOU rates while acknowledging that special efforts should be undertaken to ensure that vulnerable customer groups understand TOU rates and bill impacts and they are made aware of the support programs available to mitigate any detrimental impacts. As such, CFC recommends an opt-out provision in order to mitigate concerns with vulnerable customers.[57] CFC also cites a study that finds that low-income customers are responsive to dynamic rates and that many such customers can benefit even without shifting load. [58]

TURN cites PG&E and SCE data indicating that electricity use and income are positively correlated (i.e., that higher-income households tend to use higher quantities of electricity).[59] At first, the data seems to show a very close correlation of average price per kWh, and by extension, the amount of electricity usage, to median household income. However, PG&E provided this counterpoint:

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[54] Ahmad Faruqui, Brattle Grp., *Dynamic Pricing, The Top 10 Myths* (April 7, 2011), http://www.brattle.com/_documents/UploadLibrary/Upload936.pdf.

[55] EDF Proposal at C-2.

[56] EDF Proposal at C-6.

[57] CFC Proposal at 8 and 20.

[58] The Impact of Dynamic Pricing on Low-income Customers, IEE Whitepaper, September 2010, Prepared by Ahmad Faruqui, Ph. D., Sanem Sergici, Ph. D Palmer, A.B, cited in CFC Proposal at 8.

[59] TURN Proposal at 20.

> PG&E notes that TURN did not present any *individual household level* income to usage correlation estimates, an analytical error already noted by the CPUC in its own analysis of income-usage correlation. (See *Electricity Use & Income*, CPUC Policy & Planning Division, June 21, 2012)… Therefore, it is possible that the correlation between income groupings and average electricity use appear to be more significant than correlation between actual income and electricity use.[60]

Staff agrees with PG&E. Placing customers into larger groups such as cities and then examining the median or mean values of these groups obscures the variability in both income and electricity usage among individual customers and tends to exaggerate the actual correlation between the variables. PG&E estimates a relatively weak (0.3) correlation between income and electricity usage when customers are separated into two groups of largely similar climate zones.

TURN refers to other relevant data in the RASS Report, noting the following:

> [D]ividing usage into four quartiles, 41 percent of high-income households (above $75,000 annual income) have consumption in the top quartile (above 8,350 kWh/year), and 11 percent of high income customers consume in the lowest quartile (below 3,360 kWh/year). Conversely, only 8 percent of low-income households (below $25,000 annual income) have consumption in the top quartile, and 47 percent of low-income households consume in the bottom quartile of electricity use."[61]

In staff's opinion, the correlation of income with usage is not strong enough to support the generalized argument that low-income households are harmed by default TOU. Further, we note that studies referenced above indicate that many low-income households stand to benefit from a TOU rate. Consequently, staff believes that the various protections mandated by AB 327 are sufficient to protect households from any potential to be harmed by a default TOU rate. The protections include:

- Opt-Out: Most of the parties proposed that customers could opt-out to non-TOU rates, and now this issue is closed, since AB 327 requires an opt-out option if TOU becomes mandatory and non-TOU rates must have a minimum of two tiers.

[60] PG&E Opening Comments at 14.

[61] TURN Proposal, at 15.

- Shadow Billing: This provision enables customers to see what their bills would be under an alternative rate based on previous usage. (all three IOUs currently offer this tool online to all customers.)

- Bill Protection: This provision ensures that, for a defined period, a customer's bill will be no higher than it otherwise would have been on the prior rate, before switching. Numerous parties support some form of bill protection.

- Customer Education: A robust campaign as part of the transition to TOU rates would inform customers about the transition, prepare them to manage their energy use under the new TOU rate, and make them aware of the ability to opt out of TOU to another rate.

### C. TIERED RATES, USAGE, AND AFFORDABILITY

CforAT/Greenlining recommends a rate structure with at least three tiers, explaining that, "[a] large household that seeks to conserve energy yet still exceeds the first tier of usage should not be charged the same rate as a customer who ignores all conservation opportunities and uses energy wastefully."[62] TURN advances a related argument, stating "as a matter of policy the Commission should note that all customers benefit from lower-priced tiers …"[63]

While the Commission is certainly concerned with the reasonableness of rates for all customers, the Legislature it did not specify having a below-cost rate available to all customers, regardless of income, as a requirement, nor did the Assigned Commissioner adopt such a principle in this proceeding.

Contrary to CforAT/Greenlining's and TURN's arguments above, many customers simply do not benefit from lower-priced tiers. In order to price tier 1 and tier 2 quantities of electricity below cost, the IOUs must price upper tier quantities well above cost. Furthermore, customers who have significant usage in tiers 3 and above pay a higher average rate under tiered rates than they would under flat rates, and are thus worse off as a result of tiered rates.

[62] *Id*.

[63] Residential Rate Design Proposal of TURN, 5/29/13, at 45.

The break-even quantity of usage for PG&E customers is 193 percent of baseline, meaning that any customer who uses more than 193 percent of baseline would be better off under flat (un-tiered) rates, paying the residential average rate for every kWh he/she uses.[64] For instance, customers that pay lower-tier rates for the first 20 to 25 days of the month will still end up paying more than their cost-of-service under tiered rates if the upper tier rates they pay for the last 5 to 10 days of the month raise their average rate above the utility's average residential rate. Commission staff fields many complaints from customers with either large households or atypical needs for electricity (e.g., rural customers who pump their own domestic water or provide their own street lighting). These customers have concluded and stated that the tiered rate / baseline system is unfair to them: their uses of electricity remain basic and reasonable, yet they are not being served at an affordable rate under the current structure.

CforAT/Greenlining assert that tiered rates allow low-income customers the opportunity to keep their energy bills low. Referring to Borenstein's study of the impact of replacing tiered rates with flat rates,[65] CforAT/Greenlining observe that "this smaller benefit to high-use climate zones occurs because CARE and other lower-income customers in the same climate zone would bear significant cost increases."[66] Borenstein estimated the bill changes that switching from tiered rates to flat rates would create for customers on standard (non-CARE) and CARE tariffs, and actually supports a more nuanced interpretation of the effects of tiered rates on low-income customers. Specifically, Borenstein concludes that while tiered rates benefit some low-income customers, they harm significant numbers of others: "While household consumption level is correlated with income, the distributions make clear that there are many poor households with high electricity consumption and many wealthy customers with low consumption."[67] Staff agrees with this characterization of tiered rates and has decided to endorse TOU rates without tiers.

CforAT/Greenlining still favor a rate structure with at least three tiers, noting that a two-tiered structure would cause bill increases to some large low-income households who should receive a lower rate than households with wastefully high usage:

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[64] Energy Division analysis of PG&E rates, Schedule E-1, in effect 1/1/2013.

[65] Regional and Income Distribution Effects of Alternative Retail Electricity Tariffs, Severin Borenstein, WP-225, October 2011, at 16

[66] CforAT/Greenlining, Rate Design Proposal, 5/29/13, at 39.

[67] Borenstein, op. cit., p. 16.

> *This second tier would capture usage that is just above 'basic usage' (or even basic usage for larger households), as well as usage that is excessive and wasteful. Such widely divergent types of usage should receive different price signals. A large household that seeks to conserve energy yet still exceeds the first tier of usage should not be charged the same rate as a customer who ignores all conservation opportunities and uses energy wastefully. The Commission should retain tiered rates with at least three tiers.*[68]

This argument ignores the existence of the opposite scenario: large households that seek to conserve energy yet still exceed both the first and the second tier of usage, and as a result, regularly pay average rates above their actual cost of service. Whatever above-cost rate is assessed on tier 3 customers, it will inevitably apply to subsets of customers with large households, with inefficient appliances, or with atypical energy needs. Thus, regardless of the number of tiers, rates can never be set to reliably separate wasteful energy usage from high usage for basic, reasonable needs.

The Borenstein paper cited above provides ample evidence of low-income customers unable to avoid usage in tiers 4 and 5, who are thereby harmed by tiered rates. For customers in the $20,000 to $40,000 income bracket, approximately 7 percent of this group's usage is in tier 4 and 4 percent of usage is in tier 5 for both SCE and PG&E. For the $40,000 to $60,000 income bracket, still relatively low- to moderate-income customers, usage in tiers 4 and 5 is approximately 9 percent and 6 percent, respectively.[69] Many of these customers with usage in tier 4 and all customers with usage in tier 5 are paying higher electric bills than they would pay under flat rates. Based on SCE's analysis of customer requests for bill assistance, SCE concluded that higher-usage residential customers demonstrate greater need of relief from their bills than lower-usage customers because they are calling SCE for bill assistance (payment extensions and arrangements) at significantly higher rates.[70]

On balance, staff does not believe that tiered rates are the most effective or efficient method for protecting low-income and/or medical baseline customers. Inevitably, many low-income households are inadvertently made worse off, and many high-income households are made better off, by this relatively blunt policy instrument.

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[68] CforAT/Greenlining, Rate Design Proposal, 5/29/13, at 36-37.

[69] Borenstein, op. cit., p. 22

[70] Phase 2 Interim Residential Rate Design Proposal of SCE, November 22, 2013, p. 34.

In conclusion, staff recommends default TOU with a customer friendly opt-out, coupled with a robust education and outreach program, as consistent with rate design principle #1 and AB 327.

### 2. RATES SHOULD BE BASED ON MARGINAL COST;

### 3. RATES SHOULD BE BASED ON COST-CAUSATION PRINCIPLES

Staff disagrees with parties who argue that tiered rates reflect cost-causation. When the tiered rate structure was introduced in California in the 1970s, it was a blunt instrument that signaled to high-use customers that average costs were rising. However, with the widespread deployment of interval meters for residential customers, it is no longer necessary to rely on a crude price signal that is based on monthly consumption. In addition, we believe that TOU rates better reflect the cost of resources dispatched at different times of day, sending a more accurate signal to consumers to conserve at peak times. As such, on the basis of marginal cost principles and cost causation, staff is convinced that default TOU rates are the appropriate path forward.

Many of the default TOU proposals explicitly call for cost-based TOU rates that reflect system marginal costs. According to ORA, TOU rates should be designed to collect the residential class share of the IOU revenue requirement while reflecting predictable variations in marginal generation costs by season, day type (weekend/holiday versus weekday), and time of day – a good illustration of the application of marginal cost and cost-causation to rate design. In addition, utilities assign marginal generation capacity costs primarily to the summer peak-demand periods. Data from PG&E's 2014 GRC (phase 2) indicates that it is 40 percent less expensive, in fuel costs alone, to generate electricity during off-peak summer hours than during summer peak hours.[71] An optional dynamic pricing overlay such as CPP, proposed by several parties, would inform customers of periods of unusually high prices and/or system reliability need. Staff believes that TOU and CPP rates help individual customers to lower their bills, and utilities to lower their system costs.

In contrast, inclining tiered rates do no not reflect marginal costs since marginal costs do not increase with cumulative usage. At the heart of NRDC's proposal, however, is the simple foundational principle of inclining tiered rates: "the more you use, the more you pay."[72] Parties that favor tiered rates enlist a number of arguments for support, some more salient than others. TURN characterizes the inherent rewards and penalties

[71] ORA Opening Comments at 26.

[72] Rate Design Proposal of NRDC, 5/29/13, at 53.

to customers based on their usage, particularly during peak hours, as an advantage of tiered rates.[73] Similarly, NRDC concludes that tiered rates enable customers with "infra-marginal" incremental energy use to benefit from low marginal rates for legacy power sources (i.e., hydro).[74] Moreover, while SDCAN and Sierra Club concur with NRDC's support for this embedded cost approach, CLECA offers the following counterpoint:

> Arguments that rates should be designed by allocating lower-cost hydro (NRDC, Sierra Club) to the first tier or setting rates for higher tiers at higher levels because of lower load factors would reflect an embedded cost, rather than a marginal cost policy, which is inconsistent with decades of California cost allocation and rate design policy.[75]

Staff agrees with CLECA, and points out that a TOU rate structure would better accomplish the critical issue of addressing peak electricity usage without running afoul of well-established marginal cost principles. Some of the arguments set forth by the proponents of tiered or tiered TOU rates are rooted in regressive embedded cost principles rather than marginal cost as it pertains to incremental usage. Furthermore, every kWh consumed is as marginal as any other, since each customer's last kWh causes an equivalent marginal increase to the utility system's costs. However, the current steeply tiered rate structure results in charging the incremental usage of different customers at vastly different rates, and therefore not at marginal cost. Rather, it prices some incremental usage both above and below marginal cost, as observed by SCE in evaluating NRDC's proposed tiered TOU structure:

> SCE notes that the effect of an increasing two-tiered surcharge on a volumetric TOU rate has no cost basis, … Indeed, the arguments NRDC and others use to support tiered rates e.g., higher on-peak usage of higher-usage customers, are directly addressed by the TOU energy price signal.[76]

Externalities such as environmental costs are another critical aspect of cost-causation, as noted by NRDC: "Tiered rates convey the … recognition that only a portion of the environmental costs of electricity supply are reflected in the utility revenue requirement."[77] In justifying steeply-tiered rates, NRDC implies that marginal costs are nearly double the average total costs, or else that environmental costs are large enough

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[73] TURN Proposal, at 13.

[74] *Id*. at 35.

[75] CLECA Comments, 7/12/13, at 6.

[76] SCE Opening Comments, 7/12/13, at 27.

[77] NRDC, Rate Design Proposal, May 29, 2013, at 35.

to justify the substantial gap between the average costs of electricity supply in California and the current top-tier rates. Additionally, notably absent from parties' comments is an explanation of how their proposed top-tier rate and the first-tier rate, differing by over 100 percent, could each accurately signal the environmental costs of electricity supply to customers with varying levels of demand. The environmental costs of each of these kWh are arguably very similar, yet the rates differ dramatically. What's more, most "externalities" are already internalized into the price of electricity including the criteria pollutants sulfur oxides ($SO_x$), nitrogen oxides ($NO_x$), and particulate matter (PM). None of the parties making the "externalities" argument provide any quantification of the remaining unpriced externalities.

In contrast, TOU rates reflect cost causation principles, which dictate that peak generation capacity costs should be assigned to customers in proportion to their summer peak demand. TOU rates reflect marginal generation capacity costs being assigned mostly to summer peak-hour demand periods. TOU rates are designed to reflect the significant and predictable time variations in the energy and capacity costs caused by an additional kWh of customer demand.

Furthermore, the Commission has determined that TOU rates are likely to lower system costs.[78] In addition, the California's Energy Action Plan II identified demand response as one of the preferred resources in the "Loading Order" for addressing California's increasing summer peak energy needs to avoid increasing capacity through power plant expansion. Compared to the tiered rate structure, TOU rates better reflect the significant costs incurred to meet peak demand. Under TOU tariffs, prices are higher when demand, and in turn electricity production costs, are higher, and lower when demand and production costs are lower. In addition, high system costs often coincide with adverse environmental impacts, which are embedded in the different costs across the spectrum of resources dispatched throughout the day. For example, peaker plants tend to be the most inefficient and environmentally polluting generation facilities in terms of GHG and other criteria pollutants, and are priced accordingly.

In contrast, inclining tiered rates price all energy consumed by low-usage customers – and energy used early in the month for high-usage customers – at below average cost and price energy consumed by high-usage customers later in the month above average or even marginal cost. This type of price structure does not inherently reflect cost causation, although staff recognizes that there is often a correlation between high monthly and peak residential usage driven by AC load.

[78] D.08-07-045 at 1.

In conclusion, the principles of marginal cost and cost causation go hand in hand, and TOU rates clearly meet these criteria whereas tiered rates do not. On the basis of marginal cost principles and cost causation, staff is convinced that default TOU rates are the preferred path forward.

### 4. RATES SHOULD ENCOURAGE CONSERVATION AND ENERGY EFFICIENCY;

### 5. RATES SHOULD ENCOURAGE REDUCTION OF BOTH COINCIDENT AND NON-COINCIDENT PEAK DEMAND.

Most of the available evidence indicates that neither tiered rates nor TOU rates induce much, if any, total net reduction in energy consumption. While tiered rates do appear to reduce consumption among high-usage households, low-usage households offset those reductions through increased consumption. Similarly, TOU rates consistently reduce on-peak consumption, but some of that is offset by increased consumption during off-peak hours. Still, there is evidence of a mild net conservation effect of TOU rates.[79]

There is a large body of evidence demonstrating that TOU rates lead to reduction of coincident peak demand. Staff believes that TOU rates are more effective than inclining tiered rates at encouraging peak load shifting and reductions, which lowers overall electric system costs and benefits the environment. However, evidence is more limited as to the relative effectiveness of either tiered or TOU rates leading to non-coincident peak demand reduction. The advantage of TOU is that it leads to conservation when it matters most: on-peak. In the discussion that follows, staff evaluates the relative strengths in facilitating the achievement of these objectives.

#### A. TIERED RATES AND ELASTICITY OF DEMAND

The argument often made in favor of tiered rates is that they provide an incentive for energy efficiency, as set forth by CforAT, NRDC, SDCAN, Sierra Club, TURN, and perhaps most explicitly, ORA: "The tiered rate structure in the Introductory TOU rate encourages both conservation and energy efficiency because customers will pay more per unit when they use more energy."[80]

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[79] "2012 Load Impact Evaluation of Pacific Gas and Electric Company's Residential Time-based Pricing Programs," Freeman, Sullivan & Co., April 1, 2013. The report finds a 0. 20 kw net load reduction for non-net metered TOU customers resulting from peak load reduction coupled with increased consumption in non-peak periods. Footnote 72 on p. 50 of the Jan. 2014 printed version contained a typographical error, subsequently identified by Energy Division staff. There was an extra "0" in the footnote. The actual peak load reduction finding was 0.20 kW per participant.

[80] ORA's Responses to the Residential Rate Design OIR Questions, 5/29/2013, at 22.

Economic theory suggests that rational consumers base consumption decisions on the marginal prices they face. Many analysts have argued that this tendency causes electricity customers to use less electricity when their electric rates have an inclining block structure rather than a flat rate per kWh. Moreover, many parties assume the existence of this effect in their proposals and comments. NRDC states "While it seems intuitive that pricing that sets the rate for discretionary usage higher than the rate for essential usage would produce lower levels of total usage, some utilities and analysts continue to question this."[81]

If customers were more responsive to the upper-tier price than to the lower-tier price, then setting multi-tier rates with higher prices for upper tiers would bring about overall reductions in usage. NRDC spotlights "the only disciplined and controlled study" in this area, conducted in Wisconsin in the early 1990s, and published in the Journal of Business and Economic Statistics.[82] The study presented two elasticity estimates for each of twelve cells of customers: one elasticity of usage with respect to each of the lower-tier and upper tier prices, for a total of twenty four elasticity estimates. NRDC concludes that these estimates represent "SIGNIFICANTLY higher elasticity against the upper block price than the lower block price (meaning that the increased consumption in response to a lower first block would be much smaller than the decreased consumption in response to a higher second block.)"[83]

However, a closer look at these results reveals that only seven of the twelve groups studied had higher elasticities for the upper tier price than for the lower tier price, and that none of the twelve elasticities with respect to the upper tier prices are statistically significant. The only way to interpret these results is to determine that they provide no conclusive evidence as to whether customers respond more to upper-tier prices than to lower-tier prices. TURN and CLECA also acknowledge the dearth of available data demonstrating the impact of inclining block rates on consumption,[84] citing the low price elasticities in the Wisconsin study: "[T]he only empirical evidence presented, concludes

[81] NRDC Rate Design Proposal, 5/29/13, at 36.

[82] NRDC Rate Design Proposal, 5/29/13, at 37, citing Herriges, Joseph A. and Kuester King, Kathleen. "Residential Demand for Electricity under Inverted Block Rates: Evidence from a Controlled Experiment."

[83] Ibid, at 38.

[84] TURN Proposal, May 29, 2013, at 36.

there is an own-price elasticity of -.02 to -.04; this was found not statistically significant."[85]

NRDC asserts that it has submitted evidence "[F]rom two sources (Wisconsin's controlled experiment, and Faruqui's 2009 paper) suggesting that the elasticity to upper-block usage was about twice as high as lower-block usage."[86] However, the Faruqui paper[87] never substantiates this assumption, merely stating "Generally (but not always) Block 1 price elasticities might be expected to be lower than Block 2 price elasticities."[88] Furthermore, as CLECA points out, "none of the studies reviewed by EPRI (which Faruqui cites as a source of own-price elasticity data) involved IBP [increasing block pricing]. They only involved TOU and CPP rates."[89]

It is difficult to pinpoint elasticities at upper and lower tiers let alone the extent to which consumers are aware of the prices of each tier. CLECA addresses this, summarizing recent research in this area by Ito[90] and concluding that "customers do not pay attention to the marginal price at each tier but rather respond to the average price they pay…rather than marginal or expected marginal price."[91]

As expressed by some parties such as ORA, even if inclining tiered rates promote significant conservation, it could theoretically encourage adoption of energy efficiency measures whose costs are above the total resource and societal costs of the avoided energy and infrastructure.

### B. TOU SHORT RUN CONSERVATION BENEFITS

Staff agrees with ORA's assertion that cost-based TOU rates encourage conservation and energy efficiency by charging higher prices for energy use during higher cost, on-peak periods when the value of that conservation is the highest.[92] Staff also agrees with

[85] CLECA Opening Comments, at 7-8.

[86] NRDC, Opening Comments, at 6.

[87] Inclining Toward Efficiency: Is electricity price-elastic enough for rate designs to matter?, Ahmad Faruqui, Public Utilities Fortnightly, August 2008, p.24

[88] Faruqui, op. cit., p. 26

[89] CLECA, Opening Comments, July 12, 2013, at 8.

[90] "Do Consumers Respond to Marginal or Average Price? Evidence from Nonlinear Electricity Pricing", Koichiro Ito, Haas WP 210R, October 2012."

[91] CLECA proposal, 5/29/13, at 12-13.

[92] DRA Proposal at 24.

EDF's arguments that TOU rates encourage reduction of peak demand more than tiered rates because TOU pricing causes more costly electricity to be priced higher than less costly electricity.[93] In other words, TOU rates send a stronger price signal to all customers during the hours when those savings are associated with the highest marginal costs.

We agree with ORA and other parties who believe that TOU pricing leads to short-run behavioral change that increases conservation and load shifting. In addition, these parties contend that TOU pricing will lead to longer term investments in customer generation, customer-owned energy efficiency, and storage, as well as aiding renewable integration (e.g. increased demand at night for EV charging coincides with the highest output of wind energy). Load shifting to off-peak hours encourages marginal generation that is more efficient than the marginal generation on peak, which in turn leads to lower marginal GHG emissions and natural gas conservation.[94]

TOU proponents argue that short-run (behavioral) conservation benefits stem from price elasticity, with customers responding to peak hour prices by reducing their peak period usage. This behavior, with significant residential adoption, could help to reduce the system-wide coincident peak load and flatten the load curve.

Recent pilots have not found a significant conservation (load reduction) impact from time-varying rates (typically less than 1 percent).[95] However, the results of older TOU pilots suggested that the conservation impact could be between two and four percent.[96] It is plausible to expect that energy conservation impacts will increase over time, as customers become increasingly aware of the cost of energy and transition from behavior-based to technology-based "set-it-and-forget-it" load reduction activities.

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[93] EDF Proposal at 19.

[94] ORA notes as a hypothetical illustrative example: "a kWh shifted from 3:00 PM, when the marginal heat rate is 10,000 Btu per kWh, to say, 9:00 PM, when the marginal heat rate is 7,000 Btu per kWh, conserves 3,000 Btu of natural gas, and avoids the corresponding GHG emissions that would otherwise occur." DRA further cites recent PG&E "Effective Market Heat Rate" data provided in its work papers to its 2014 GRC to confirm that such large differences in the marginal heat rate within a summer weekday are typical.

[95] Faruqui, A., Hledik, R, Palmer, J. (2012) *Time-Varying and Dynamic Rate Design,* The Brattle Group and Regulatory Assistance Project.

[96] King, C., & Delurey, D. (2005). Efficiency and Demand Response: Twins, Siblings, or Cousins? *Public UtilitiesFortnightly.* Available at http://www.fortnightly.com/result.cfm?i=/4506.cfm

Only TURN disputes the conservation and GHG emission reduction benefits of TOU rates,[97] arguing that load shifting by itself does little to achieve environmental objectives of reducing pollutants or GHG emissions:

> Any potential emissions reductions due to load shifting result from the difference in heat rates between marginal units and shoulder peak units, which are both likely to be natural gas fired generators. Simply put, the net emissions reduction over 100 hours is small.[98]

TURN further asserts that TOU rates could degrade the value of energy efficiency measures that produce savings outside of peak periods, and they posit whether any peak period environmental savings would not be more than offset by the environmental impacts of increased off-peak usage.

ORA counters this argument by demonstrating that off-peak generation units have a lower heat rate then on-peak units. One source of evidence is PG&E's heat rate data presented in its 2014 GRC which show an off-peak average heat rate of 5,900 Btu per kWh compared to a summer peak average of 9,100 Btu/kWh[99]. This implies that, during off-peak hours, there are relatively efficient natural gas units that are idle due to low demand. If TOU-induced load shifting were to occur in California, it is more likely that these idle more efficient units would be called upon before any "dirtier system power from the southwest" would be, as TURN has charged.[100]

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[97] TURN Proposal at 42-44.

[98] *Id*. at 42.

[99] ORA Reply at 15 includes the following footnote: PG&E's 2014 GRC Ph. 2 (A.13-04-012) marginal energy cost workpapers contain hourly "effective marginal heat rate" data by month and by [California Independent System Operator (CAISO)] peak and off-peak period based on four years of CAISO locational marginal price data. ORA computed the average summer peak period heat rate based, on the CAISO peak period data for May-October (from noon to 6:00 PM), as 9,100 Btu/kWh. The off-peak average heat rate, of 5,900 Btu/kWh, was computed similarly. The calculation used the CAISO peak hour data for those hours that occur within the 16-hour CAISO peak period and the off-peak period data only for those hours that fall outside the CAISO 16 hour peak period.

[100] TURN cites a Synapse study which it claims concludes that energy efficiency in California is more likely to displace dirtier out of state coal then in state natural gas. TURN argues that TOU induced peak demand displaces in state natural gas which is largely true, but TURN fails to make a convincing argument that TOU undermines energy efficiency. See TURN Reply Comments at 12-18 citing Emissions Reductions from Renewable Energy and Energy Efficiency in California Air Quality Management Districts, Public Interest Energy Research Program Final Project Report, prepared by Synapse Energy Economics for the California Energy Commission, November 2011. (Hereafter *Synapse study*).

### C. EMPIRICAL DATA ON TOU AND CPP DEMAND RESPONSE

Many studies show that residential consumers reduce their peak demands in response to TOU peak period prices.[101] Therefore, an appropriately cost-based TOU summer on-peak rate would induce customers to reduce coincident peak demand.

A widely cited study of time variant pricing is the 2012 Brattle Group "Meta-Analysis of Dynamic Pricing Studies- Some Initial Findings," by Ahmad Faruqui, Sanem Sergici, and Eric Shultz. This study presents the findings of 33 electricity pricing studies containing 151 pricing and technology treatments.

The analysis finds that there is a statistically significant positive relationship between the price ratio and load reduction, but with diminishing returns as the price ratio increases. The analysis also finds that the load reduction is significantly enhanced when enabling technology is present. The relationship of price ratio to load reduction with and without enabling technology is shown in Table 4-3 below. The study includes both TOU and CPP pricing studies. Importantly, price ratios of 5 and 10 are more typical of CPP products and a ratio of 2.5 is more typical of well-differentiated TOU rate designs.

**Table 4-3 Peak to Off-Peak Ratios and Peak Demand Reduction**

| Peak Ratio (Peak to Off-Peak) | Percentage Peak Demand Reduction | |
|---|---|---|
| | Price Only | Price with Enabling Technology |
| 2.5 | 9.6 percent | 14.9 percent |
| 5 | 12.8 percent | 22.1 percent |
| 10 | 15.9 percent | 29.3 percent |

In addition, there is other empirical evidence that TOU programs lead to significant peak load reduction, including the following studies and/or program evaluations:

- Sacramento Municipal Utility District's (SMUD's) Smart Pricing Options Pilot found peak load reductions for TOU pricing plans were significant for both opt-in and default participants and peak load reductions were higher when pricing plans were coupled with in-

[101] An NRRI literature survey, *How to Induce Customers to Consume Energy Efficiently: Rate Design Options and Methods*, p.63, by Adam Pollock and Evgenia Shumilkina of the National Regulatory Research Institute, identified electricity demand elasticity is about 0.7 in the long run and 0.2 in the short run.

home displays (IHDs). The peak load reductions were 13 percent and 10 percent peak load reduction from opt-in TOU plans respectively, with and without in-home displays (IHDs). Both the default TOU and TOU/CPP options include IHDs and the peak load reductions for default TOU was 6% compared to 8% for CPP/TOU. It is worth pointing out that aggregate load impacts are much larger for default enrollment than for opt-in enrollment due to the much higher acceptance rate for the default population compared to the opt-in population.[102]

- The CPUC funded "Impact Evaluation of the California Statewide Pricing Pilot" found a 5.9% reduction in peak load from TOU pilot programs.

- **PG&E's optional E-7 TOU (now closed to new customers) and optional E-6 TOU showed a 12.6% average peak load reduction per participant in 2012.** TOU load reductions were greater over the summer (May-Oct) than the winter (Nov-Apr), when the difference between peak and off-peak prices is the largest. The reductions were larger both in absolute and percentage terms. During the summer, the average load reduction was 0.20 kW, or 12.6%. One other key finding is that given their price response, about 76% of customers enrolled on TOU rate saved in comparison to what their electricity bill would have been with flat rates. In total, the evaluation results are representative for approximately 60,000 non net-metered E 6 and E-7 accounts.[103]

### D. ESTIMATES OF SYSTEM COST REDUCTIONS RESULTING FROM TOU PRICING

Staff believes that TOU pricing does lead to lower system costs because reduced peak load lowers marginal generation costs as well as transmission and distribution costs. ORA estimated the benefits of TOU rates achieving 9.6% peak load reduction predicted in the Brattle Group analysis for a 2.5 price ratio. ORA used a TOU rate with a 2.5 peak-to off-peak ratio, and analyzed two cases: No net conservation (100% of load reduction is shifted to off-peak time periods), and 5% net conservation (95% of load reduction is shifted to off-peak time periods). If a 9.6% peak reduction could be achieved through a hypothetical statewide roll out of TOU rates, ORA estimates that the peak load reduction would be 2,400 megawatt (MW), which is greater than the capacity of one of

[102] "Interim Results from SMUD's Smart Pricing Options Pilot", Presented at the CRRI 26th Annual Western Conference, June 19-21, 2013. Dr. Stephen S. George, Freeman, Sullivan & Co. Ms. Jennifer Potter, Sacramento Municipal Utility District.

[103] "2012 Load Impact Evaluation of Pacific Gas and Electric Company's Residential Time-based Pricing Programs," Freeman, Sullivan & Co., April 1, 2013.

California's nuclear generating stations. ORA's full estimate of the benefits of a hypothetical statewide roll out of TOU rates are below.

**Table D-2: Hypothetical TOU Benefits of a Statewide TOU Rollout (Based on Ten Million Participants)**

| Case | MW Reduction | Peak MWH Reduction | Total MWH Reduction | Natural Gas Reduction (MMBtu) | GHG Reduction (tons CO2eq.) | Dollar Value |
|---|---|---|---|---|---|---|
| 0% Conservation | 2,400 | 1,439,870 | - | 4,319,610 | 234,490 | $ 169,075,000 |
| 5% Conservation | 2,400 | 1,439,870 | 71,990 | 4,823,560 | 261,850 | $ 172,142,000 |

**Table 4-4 Hypothetical TOU Benefits of a Statewide TOU Rollout (Based on Ten Million Participants)**

In 2005, Charles River Associates (CRA) published a Commission-funded comprehensive analysis of how California ratepayers would respond to time-variant electricity prices, including TOU.[104] By applying the elasticities found in the CRA study to the marginal cost and heat rates of recent IOU GRCs, EDF's proposal estimated potential utility cost savings that would occur with 50% penetration of TOU rates. Their analysis found that each year, reductions in peak demand would reduce costs by $113 million for PG&E, $357 million for SCE, and $2.6 million for SDG&E.[105]

### E. COINCIDENT AND NON-COINCIDENT PEAK REDUCTION

Many parties cite to arguments or data as to why higher-usage customers tend to have a higher percentage of their usage on-peak. TURN asserts that "customers who use less total electricity also consume less on-peak electricity. This outcome results from the fact that high consumption in California is linked to on-peak air conditioner use."[106] The implication is that high-use customers can only effectively avoid upper-tier prices by reducing their use of air conditioning, much of which use occurs on-peak, and that therefore such customers will reduce their use of air conditioning on-peak in response to tiered rates. While this may be true, no party provided evidence that tiered rates achieve this result at all, much less that they are more effective than TOU rates at reducing coincident peak.

[104] "Impact Evaluation of the California Statewide Pricing Pilot," Charles River Associates, 2005, CPUC.

[105] EDF Proposal at A-5.

[106] TURN proposal, 5/29/13, at 13.

Parties also largely failed to substantiate claims as to the effectiveness of the tiered rate structure in reducing non-coincident peak demand. ORA states "Inclining block or inclining tiered rates encourage a reduction of non-coincident peak demand since the higher rates that come from increased usage encourage customers to reduce their own demand regardless of when it occurs."[107] Similarly, NRDC states "Reduction of customer non-coincident demands will occur as total consumption is constrained …"[108] Neither of these statements provides sufficient evidence of any incentive in tiered rates for customers to avoid running many appliances at once, for instance, in order to reduce their non-coincident peak demand. On the other hand, CLECA offers little in the way of support for its assertion that tiered rates have no impact on either type of peak demand.[109]

Based on strength of evidence, tiered and TOU rates are equal with respect to overall non-coincident demand reduction, while TOU is clearly superior with respect to coincident demand reduction. In sum, staff believes that TOU rates are more effective than inclining tiered rates at encouraging conservation and energy efficiency through peak load shifting and reductions, which lowers overall electric system costs and benefits the environment.

#### 6. RATES SHOULD BE STABLE AND UNDERSTANDABLE AND PROVIDE CUSTOMER CHOICE.

Staff believes that TOU rates provide customer choice. First, the customer can choose whether to shift usage to a less expensive time period and save money. Second, whether as an opt-in rate or a default rate with the ability to opt out, the customer can choose whether TOU makes the best sense for them and whether they want to be on the rate. Additionally, staff believes that TOU rates will be easier for customers to understand compared to tiered rates. There is some evidence that this may already be the case.

A survey[110] conducted by the IOUs demonstrates that that TOU pricing is already well known or understood by customers. SCE cites that although 20 percent of customers incorrectly assume they are on a TOU rate today, 75 percent of customers have attempted to shift their energy usage during different times of the day even though shifting usage to an off-peak period has no impact on bills under a tiered rate

[107] ORA, Proposal, May 29, 2013, at 26.

[108] NRDC Proposal, at 55.

[109] CLECA Opening Comments, at 8.

[110] Topline Report, p. 7; sent to parties via April 16, 2013 e-mail from Emily Bartman of PG&E.

structure.[111] The survey found that only 50 percent of customers know they are on a tiered rate, while the other 50 percent are unsure or wrong about their current structure.[112] A sizeable group of customers also said they would be willing to risk higher bills for the chance to realize bill decreases, with over 70 percent of respondents saying they would consider switching. SCE, EDF, and ORA conclude that this may indicate that educating customers about a simple TOU tariff may be less difficult than educating customers about a pricing system that includes multiple tiers with increasing prices in each tier where the price bears no relation to the time when the electricity is used.

Several parties such as CLECA point out that customers are already familiar with time variant pricing from other products and industries such as long-distance call plans and peak-time congestion pricing on highway tolls, bridges, and parking meters. Several parties suggested that TOU time periods be set in GRCs and remain fixed for at least the length of a GRC cycle (about 3 years) so that they would be easier to remember. AB 327 requires that the Commission strive for TOU time periods that are appropriate for at least 5 years.

In contrast to TOU rates, EDF argues that tiered rates are not well understood or actionable (EDF Proposal at 20). When customers learn they have crossed into the next tier of consumption, it is too late for them to respond. Furthermore, staff agrees with EDF's assessment of the respective customer options that each rate structure offers:

> TOU provides three different methods for ratepayers to reduce their monthly electricity bill while tiered rates essentially provide two. Under tiered rates, individuals can either (a) reduce their consumption or (b) invest in more efficient appliances, the latter of which requires access to capital or credit. TOU rates similarly present these incentives to conserve or invest in efficiency, but also provide an extra method to reduce electricity bills by (c) shifting electricity use to less expensive times.[113]

The proponents of TOU rates were split between those who prefer un-tiered TOU rates as the end-state and those that want to retain baseline protection either through tiered TOU rates or TOU rates with a baseline credit. It is difficult to argue that tiered TOU

[111] Topline Report, pp. 7, 11.

[112] Topline Report, p. 7.

[113] EDF, Proposal, at 13.

rates are more understandable then un-tiered TOU rates. Under existing optional four tiered TOU rates, such as PG&E's Schedule E-6, customers face 20 different prices (four tiers, three summer periods, and two winter periods). Similarly, ORA's proposed 3 tier "Introductory TOU" rate would have 15 different prices which would be an improvement, but would still likely be far too many prices for a customer to easily comprehend. ORA takes issue with this characterization, pointing out its "Introductory TOU" rate can be understood as three rates (for three tiers) plus a surcharge for peak usage and a credit for off-peak usage, and that the underlying tiered rates and surcharges and credits are identical in the summer and winter except for the fact that there's no surcharge in the winter. In any case, even though the rate can be expanded to nine rates in the summer and six in the winter, ORA believes there is no need for the customer to keep track of fifteen rates. ORA states that the whole intent of ORA's proposal was to simplify a more complex rate structure. [114]

ORA's Introductory TOU rate is understandable because ORA designed it to maintain the current tier structure during the transition period to moderate bill impacts. The underlying 3-tier rate structure would be the same for all customers with the only difference being that TOU customers would face a peak period surcharge and receive an off-peak period "sur-credit." ORA maintains that it provides rate stability and a smooth evolution from the current rate structure to a pure TOU rate. ORA's end-state default TOU rate with a baseline credit would optically look like a non-tiered TOU rate, but function like a 2-tier TOU rate. This is less complex than the 3-tier TOU rate proposed by Sierra Club/NRDC.

In comments, ORA points out that its hybrid "Introductory TOU" rate proposal would reduce the potential for revenue shortfalls from low-usage customers migrating from TOU rates to tiered rates. "ORA discussed the revenue shortfall problem in response to Question 5 of the March 19, 2013 ALJ ruling, which asked 'What unintended consequences may arise as a result of your proposed rate structure and how could the risk of those unintended consequences be minimized?' The unintended consequence is revenue shortfall and that risk could be minimized by using an introductory TOU rate design." [115]

Supporters of un-tiered default TOU rates acknowledge that ORA's proposed transition strategy has merit with the eventual goal of a default cost-based TOU rate. On balance, though, staff believes that hybridized, transitional tiered TOU rate proposals would

[114] See, ORA comments issued January 31, 2014, p.9

[115] Id.

lead to customer confusion and send a mixed message about the transition away from tiered rates. Staff believes untiered TOU rates will be the simplest for customers to understand.

### 7. RATES SHOULD GENERALLY AVOID CROSS-SUBSIDIES, UNLESS THE CROSS-SUBSIDIES APPROPRIATELY SUPPORT EXPLICIT STATE POLICY GOALS.

Based on marginal cost and cost causation principles, TOU rates avoid two types of cross-subsidies present in current tiered rates:

- High tier energy users subsidize the energy consumption of low-tier users.
- Likewise, less peaky users subsidize the energy consumption of peaky users.

ORA'S TOU rate with a baseline credit will reduce cross-subsidies relative to current levels. Retention of baseline credits and/or tiers with TOU rates is favored by ORA and other parties as a desirable subsidy to ensure affordability for low usage customers in continued compliance with the Warren-Miller Energy Lifeline Act of 1976.[116]

Staff recommends two distinct rates in parallel: (1) an un-tiered default TOU rate that meets CPUC rate design goals[117], and (2) an opt-out tiered rate that satisfies AB 327 requirements and represents significant progress towards cost-based rates. This approach splits the difference in subsidies that support state policy goals. Un-tiered TOU rates remove much of the rate subsidies and represent a rate design that is more reflective of the true cost of service. A mildly differentiated opt-out 2-tier rate satisfies legislative requirements and is a great improvement over the current inequitable rate structure.

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[116] ORA proposal at 30. The Warren-Miller Energy Lifeline Act of 1976 required the Commission to designate a baseline quantity of gas and electricity, necessary to supply a significant portion of the reasonable energy needs of the average residential customer, at affordable rates below average cost.

[117] According to ORA, existing law requires that any default rate include a baseline discount. ORA has commented that: "Yet the baseline statute, which is contained in P.U. Code 739, remains in effect and must be implemented in the default rate. Offering a default rate without a baseline tier or credit constitutes a legal error." See, ORA's comments dated January 31, 2014, p.6. If the Commission were to issue a finding agreeing with ORA's interpretation, the recommended end-state default TOU rate could include a baseline credit (as proposed by ORA).

### 8. INCENTIVES SHOULD BE EXPLICIT AND TRANSPARENT;

### 9. RATES SHOULD ENCOURAGE ECONOMICALLY EFFICIENT DECISION MAKING.

Staff believes that higher on-peak rates provide an explicit and transparent incentive to reduce or shift peak usage and encourage usage in off-peak times. For example, ORA argues that "Cost-based TOU rates are intended to reflect rates based on cost causation, hence, the incentive should be explicit and transparent."[118] EDF sums up their view of transparent incentives and economic efficiency with TOU rates as follows:

> With TOU, the customer has clear price signals which do not vary with use, but instead vary daily and seasonally; this is an understandable pricing scheme that empowers ratepayers to make optimal decisions, such as running equipment more intensely when power is cheap and orienting solar cells towards the west to produce more power when it is most valuable.[119]

If customers know how much a unit of electricity costs, then they can optimize the quantity to purchase given their budget constraints. Tiered rates in EDF's view are less transparent to the customer: "…it is hard to respond to these dramatically increasing rates – once a customer has reached the tipping point from one tier to another, she cannot go back."[120]

TOU rates can efficiently facilitate deployment of distributed resources by enhancing the economic attractiveness of certain types of distributed resources such as rooftop solar and energy storage, which allow owners to avoid consuming electricity during higher priced peak hours. TOU rates may also be a way to encourage more efficient off-peak charging of electric vehicles.[121]

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[118] ORA Proposal at 30.

[119] EDF Proposal at 23. For example many solar photovoltaic (PV) systems produce energy throughout the day, but most IOU TOU peak periods are mid-afternoon to early evening. Thus, there is more price incentive to orient a PV system to the west maximize late afternoon production.

[120] EDF Proposal at 23.

[121] Faruqui, A., Hledik, R., Levy, A., & Madian, A. (2011). Smart Pricing, Smart Charging. *Public Utilities Fortnightly.* Available at http://www.fortnightly.com/archive/puf_archive_1011.cfm

### 10. TRANSITIONS TO NEW RATE STRUCTURES SHOULD EMPHASIZE CUSTOMER EDUCATION AND OUTREACH THAT ENHANCES CUSTOMER UNDERSTANDING AND ACCEPTANCE OF NEW RATES, AND MINIMIZES AND APPROPRIATELY CONSIDERS THE BILL IMPACTS ASSOCIATED WITH SUCH TRANSITIONS.

All parties place great emphasis on the importance of a thoughtfully designed transition strategy that achieves the goals of principle #10. Robust customer education is stressed by many parties in light of the low awareness of current rate structures and to prepare customers for the transition.

As part of a gradual transition to an end-state default TOU rate:

- All parties emphasize customer education and outreach prior to the default.
- Several parties propose gradually adjusting the current tiered rate structure prior to default in a variety of ways designed to reduce the inequities of the current tier structure while also ensuring bill changes are gradual. These changes include: reduction to 3 tiers (SEIA/Vote Solar, NRDC, Sierra Club); bill protection for extended periods (EDF, CFC); and bill increase limiters (EDF, NRDC).
- ORA proposes a default "Introductory TOU Rate" with the option to opt out to a 3 tier non-TOU rate with the same structure as the transition TOU rate minus the on-peak surcharge and off-peak credit. ORA proposes a final default TOU rate with the option to out to a 2-tier structure.

The suggestion by many parties to gradually alter the current 4-tier rate structure as part of a transition to an alternative cost-based rate structure is a very sound idea, because the greatest source of harmful bill impacts in the current 4-tier structure is upper tier rates that are priced far above cost. Significant bill impacts will occur when transitioning to more cost-based rates due to current distortions. Therefore a gradual transition is recommended that incrementally reduces the number of tiers and tier differentials as part of a transition to cost-based rates. ORA echoes this challenge when they observe that the bill impacts of their illustrative opt-out three tier transitional rate option are very similar to those of the default Introductory TOU Rate option. ORA suggests "…the bulk of the impacts from the Introductory TOU rate comes from reducing the number of tiers and not from the TOU surcharge and credit."[122]

[122] ORA Proposal at Appendix B, pg. B-1.

Staff recommends a gradual transition to default TOU by 2018 that is appropriately cognizant of the impacts of reducing from four to two tiers as well as the impact of default TOU rates, and is accompanied by marketing, education, and outreach plans to educate and prepare customers for the new rates.

## 4.3 TOU TIME PERIODS AND SEASONS

Staff believes that TOU time periods and rate design need to be carefully developed in the context of GRCs, or comparable rate setting proceedings. Between now and the time of the default to TOU rates in 2018, the Commission should assess the appropriate TOU time periods and seasons that best reflect marginal costs and advance the OIR rate design principles.

If the Commission were to adopt TOU rates as a component of a residential rate design, it would need to establish TOU pricing time periods and seasons. AB 327 requires the Commission to strive for TOU rates "that utilize time periods that are appropriate for at least the following five years." To achieve this directive, TOU rates should be designed to collect the residential class share of each IOU's revenue requirement while reflecting predictable variations in marginal generation costs by season, day type (weekend/holiday versus weekday), and time of day.

Most TOU proposals did not suggest specific deviations from the current TOU time periods and seasons currently in use by the IOUs' optional TOU rates as shown in Table 4-5. This is not necessarily an endorsement of the current time period definitions; Most parties recognize that TOU time periods and seasons will likely need to change in the future to reflect changes in customer load shapes, shifts in system peak and utility marginal costs, the value of generation on the grid at different hours of the day as well as "...the changing nature of how customers will demand power from, and increasingly will supply power to the grid."[123]

[123] SEIA/Vote Solar Proposal at 27.

### Table 4-5 Existing IOU TOU Pricing Time Periods and Seasonal Definitions

| | Summer, May 1 – Oct 31 | | | | | Winter, Nov 1 – Apr 30 | |
|---|---|---|---|---|---|---|---|
| | | **Peak** | **Semi-Peak** | **Off-Peak** | | **Peak** | **Off-Peak** |
| **PG&E TOU E-6** | Weekdays | 1-7 pm | 10 am – 1 pm<br>7 pm – 9 pm | 9 pm – 7 am | | 5-8 pm | All other hours |
| | Weekends & Holidays | | 5-8 pm | All other hours and holidays | | | All hours |
| | | | | | | | |
| | **Summer, June 1 – Sept 30** | | | | | **Winter, Oct 1 – May 31** | |
| **SCE TOU D-T**[124] | Weekdays | Noon – 6 pm | | All other hours and holidays | | Noon – 6 pm | All other hours and holidays |
| | Weekends & Holidays | | | All hours | | | All hours |
| | **Summer, May 1 – Oct 31** | | | | | **Winter, Nov 1 – Apr 30** | |
| **SDG&E DR-TOU** | Weekdays | 12 – 6 pm | | All other hours and holidays | | 12 – 6 pm | All other hours and holidays |
| | Weekends & Holidays | | | All other hours | | | All other hours |

Many parties stated that TOU time periods and rate design are best addressed in the GRC process when detailed marginal generation costs are litigated.[125] Some parties offered specific suggestions such as EDF, which proposes the following TOU periods: peak: 4 pm-7 pm; off-peak: 4 am – 4 pm and 7 pm - midnight; and super off-peak: midnight – 4 am to encourage off-peak charging of electric vehicles. EDF states that TOU seasons should align with seasonal changes in utility costs and be modified at least as regularly as GRCs. For TOU time periods EDF recommends minimizing time windows for peak prices for two reasons: shorter windows necessitate steeper peak to off-peak ratios that engender greater price response, and shorter windows are more practical for customers to respond to. EDF also recommends maximizing super-off peak time windows to encourage EV charging and align with diurnal changes in costs.

[124] See SCE comments filed January 31, 2014 at 2 for its corrections to Table 4-5.

[125] SEIA/Vote Solar Proposal at 15.

SDG&E does not provide specific TOU periods, but proposes a super-off peak night rate to encourage EV charging when marginal costs are lowest. CLECA also proposes a short on-peak period, from 4 - 7 pm, or as determined in a GRC based on changing load shape and the system net load shape.

Several parties referred to the CAISO Net Load Forecast (aka the "Duck Curve"). The CAISO forecasts what it calls "net load," which reflects load net of CAISO forecasted intermittent renewable generation. With a large increase in solar PV output, both on a central station and distributed basis, the CAISO forecasts a substantial "net load" reduction in the afternoons and a steep ramp in the evenings as PV output falls. In the future, the CAISO also predicts a morning peak, then lower loads during the afternoon in the summer, followed by significant late afternoon and evening ramps. With such changes, the TOU periods may need to shift, with the peak moving into the evening hours all or part of the year.

SEIA/Vote Solar urge the Commission not to prejudge what those future changes may be. Some parties suggestion a shift of the peak hours into the evening which would reduce the value of solar. In response, SEIA/Vote Solar point out that such a shift does not diminish the value of solar that is on the grid now or that is being added now. While it may affect the value of solar in the future there are other possibilities that need to be considered. SEIA/Vote Solar notes that peak electric demand in California is expected to increase relative to average use due to faster population growth in warmer inland areas compared to the coast and due to climate change.[126] If true, these trends could offset the shift in peak.

**Staff Recommendations for TOU Time Periods and Seasons**

Given the points raised in this discussion, staff believes that TOU time periods and rate design need to be carefully developed in the context of GRCs, or comparable rate setting proceedings. Between now and the time of the default to TOU rates in 2018, the Commission should assess the appropriate TOU time periods and seasons that best reflect marginal costs and advance the OIR rate design principles. AB 327 directs the Commission to strive to adopt time periods for TOU rates that are appropriate for five years. Changes to separate EV rates will be handled in a new OIR dedicated to EV rates that began in late 2013. Some of the questions and issues the Commission will need to consider when updating TOU time periods and seasons include the following:

[126] CEC 2012 Integrated Energy Report Update, at Table 1, available at http://www.energy.ca.gov/2012publications/CEC-100-2012-001/CEC-100-2012-001-LCD.pdf .

- How steeply differentiated to make the peak to off-peak and semi-peak to off-peak ratios;
- Whether shorter or longer peak pricing periods will induce more peak demand reduction and shifting;
- Whether to have a single peak period reflecting the highest marginal energy costs in the day or two diurnal peaks –one reflecting the morning ramp and the other the late afternoon/evening ramp;
- Whether to include a super off-peak rate in general TOU rates to encourage off-peak EV charging or to encourage EV owners to switch to an EV-specific rate schedule;
- Whether TOU time periods and seasons should be consistent statewide for all IOUs for the purpose of coordinating outreach and education;
- How best to balance the need for technical precision around system needs with consumer comprehension and ability to take action; and
- The appropriate rate setting proceeding to address these issues in a coordinated fashion in time for 2018, and the process and frequency of subsequent changes.

## 4.4 TOU OPT-OUT VS. OPT-IN

There is strong evidence indicating that the adoption of TOU rates is much higher when offered on an opt-out basis compared to an opt-in basis. Staff recommends default opt-out TOU rates based on strong evidence that default TOU rates will lead to far greater peak load reductions then purely opt-in TOU rates. In addition, if the Commission were to direct the IOUs to adopt default TOU rates, then it must also determine the appropriate cost structure and strategy for opt-in TOU tariffs that could be offered to customers prior to 2018, the earliest that statute permits residential customers to be defaulted to a TOU rate. Staff believe that cost-based opt-in TOU (un-tiered) is desirable during the 2015-2017 transition to default opt-out TOU rates.

A recent Department of Energy (DOE) study compiled customers' enrollment patterns in TOU rate programs, and confirmed that there is a much higher recruitment rate for the default (opt-out) than the opt-in approach:

> More customers enroll in time-based rate programs with opt-out offers than with opt-in offers. When customers were solicited to join a study

> using **opt-out** recruitment approaches, the programs had an average recruitment rate of 84% (i.e., those solicited did not reject the offer and were placed into a program). On the other hand, when customers were solicited using **opt-in** recruitment methods (i.e., the customers were informed of the study and asked to join) only 11% accepted the offer.[127]

This study thus found an eight-fold increase in recruitment rates from the opt-out approach. Acceptance rates for SMUD's recent time-variant pricing pilot were in the high 90% range. Specifically SMUD's pilot study found retention rates of 96% for default CPP, 98% for default TOU, and 93% for default CPP/TOU. On the other hand, the same pilot program also included customers that were given the opportunity to opt-into TVP rates and about 10-15% of participants volunteered to join a TVP rate.[128]

Achieving meaningful load and cost reductions through TOU rates requires customer acceptance and high recruitment rates. Historically, the three California IOUs have achieved extremely low adoption rates for opt-in time-variant pricing – less than 0.5%. ORA notes[129] that considerable sums have been spent on advertising, marketing, and outreach to encourage voluntary adoption of TOU rates with very low resulting adoption rates. For example, SCE implemented a proactive residential customer outreach campaign in 2011 and 2012 to encourage enrollment in the currently available tiered TOU rate. The campaign was focused on 90,000 customers who would likely benefit from the offering. The campaign resulted in an overall adoption rate of only 4.8% of the targeted population.[130] SCE acknowledges that it would take years of such activity to reach a meaningful penetration of opt-in TOU rates. In fact, it took some 20 years for Arizona Public Service Company (APS) to reach its 50% adoption rate.

One reason why opt-in TOU rates generally have low adoption rates is that, according to the Topline Survey, 40% of customers are risk averse and not willing to gamble on a higher bill for potential savings.[131] The survey also indicates that bill protection would

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[127] Analysis of Customers' Enrollment Pattern in Time-based Rate Programs – Initial Results from the *SGIG Consumer Behavior Studies*, Published by DOE in July 2013.

[128] Sacramento Municipal Utility District, Interim Result from SMUD's Smart Pricing Options Pilot, Presented at the CRRI 26th Annual Western Conference, June 19-21, 2013, by Dr. Stephen S. George, Freeman, Sullivan & Co. and Jennifer Potter, SMUD, Slide 8.

[129] ORA Opening Comments at 24.

[130] SCE Proposal at 49, FN 75.

[131] "Hiner & Partners, Inc., Residential Rate Design OIR Customer Survey Key Findings" (Topline Survey), May 29, 2013, Slide 31.

increase customers' willingness to try TOU rates. However, given the reluctance of customers to adopt TOU rates, no party has provided a clear transition plan that would meaningfully increase customer adoptions of TOU rates, if offered only on a voluntary basis.

Neither SCE or PG&E proposed default TOU as their preferred default rate due to concerns about customer acceptance of being defaulted onto TOU rates, but both proposed cost-based un-tiered TOU be offered throughout the transition period as part of a strategy to engage customers to voluntarily adopt TOU rates. SCE explains how this strategy would be carried out:

> As SCE's higher-usage customers migrate from the above-cost, higher-tiered rate levels to an optional cost-based TOU rate, a deficiency in revenues collected from SCE's residential rate group will develop. Any revenue deficiency resulting from this migration to TOU rates should be recovered from residential customers served on below-cost rates.[132] This adjustment would be part of a convergence strategy that ultimately results in cost-based rates being applied to both TOU and tiered rate customers. More importantly, it provides customers who are most dissatisfied with the current tiered rate structure an immediately-available option to transition to a cost-based rate structure. While upper-tier customers would benefit from such a TOU structure, it could be several years before education and outreach efforts produce significant customer rate migration. Compared to the current residential rate structure, approximately 30% of SCE's residential customers would benefit on a non-tiered, cost-based, TOU rate. As this rate convergence progresses, customers with higher cost to serve load patterns will remain on the tiered rate, which should ultimately be adjusted in future GRC rate design proceedings to include a cost premium relative to the cost-based TOU rate.[133]

Staff is not convinced by SCE's and PG&E's arguments for keeping TOU rates as opt in. However, their proposed strategy of offering cost-based non-tiered TOU opt-in rates could be applied during the transition to default TOU rates. Several other parties from diverse perspectives agree. For example, TURN states:

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[132] Any revenue deficiency would need to be retained in the residential class, consistent with cost causation, and subject to periodic updates, likely in the IOUs' annual ERRA proceedings.

[133] SCE Proposal at 47.

> There are some customers who would benefit from dynamic pricing and are not adverse to the associated risks. In order to maximize voluntary participation, TURN would support the creation of a simplified TOU rate option that does not rely on tiers. Such an option would allow for greater experience with residential TOU rates based on voluntary participation. Although we presume that most customers opting into a TOU rate would be structural winners with favorable load shapes, these customers would continue to have incentives to further shift their loads to off-peak periods… TURN appreciates that if structural winners choose an optional TOU rate, there would eventually be a revenue loss that would result in a cost shift to other customers. As long as the TOU rate is properly designed to truly reflect temporal differences in generation costs, such a shift would appropriately increase the prices paid by other customers. [134]

SEIA/Vote Solar express support for a similar opt-in approach to TOU and tiered rates during the transition period. As more customers migrate onto TOU rates the TOU rate would be based on the lower costs to serve those who have switched. In parallel, the tiered rate would be designed to recover the higher cost of service for those that remain on the tiered rate.[135]

Staff believe that cost-based opt-in TOU is very appropriate during the 2015-2017 transition to default opt-out TOU rates. The same arguments IOUs make for opt-in TOU during the transition to fewer tiers could be valid during the transition period to default TOU by attracting voluntary customers onto TOU before it becomes the default.

ORA concludes based on market evidence that: "With adequate customer education, the Commission could proceed directly to an opt-out TOU program."[136] The evidence available confirms that higher penetration rates could be achieved with opt-out and we believe that such an approach could provide meaningful benefits in terms of peak period and potentially system cost reductions, without sacrificing customer acceptance if paired with consumer-friendly opt-out provisions. In addition, it would be beneficial to offer a cost-based TOU rate without tiers during the transition so that customers could immediately take advantage of cost-based rates.

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[134] TURN Proposal at 11.

[135] SEIA/Vote Solar Proposal at 26.

[136] ORA Reply Comments at 12.

## 4.5 RATE STRUCTURE IMPACTS ON NET ENERGY METERING (NEM) AND DISTRIBUTED GENERATION (DG) CUSTOMERS

A significant revision to the current rate structure that lowers upper-tier rates will likely affect the value of existing and potential DG installations under NEM. The ALJ Ruling of March 19, 2013 asked, in Question 3: How would your proposed rate design affect the value of net energy metered facilities for participants and non-participants compared to current rates? Parties expressed several concerns regarding the impact of tier flattening, TOU rates, and fixed charges or demand charges on the incentive for customers considering installing NEM facilities in the future as well as the impact of these rate elements on existing NEM customers.
Most parties acknowledge that tiered rates tend to increase the value of NEM facilities to participants, and that the steeper the tiers, the greater the value to participants. The utilities and EDF state that tiered rates tend to shift costs from NEM participants onto non-participants, which in their view justifies substantial revisions to existing rates. Other parties either assert that such a cost shift does not occur or is warranted to promote energy policy goals.

DECA and SEIA/Vote Solar stressed the need to protect existing NEM customers in their proposals. Specifically, DECA recommends a grandfathering approach, stating that NEM customers should "be allowed to fully net their load as they currently are permitted to do and that they be held harmless relative to any reduction in the value of netted energy should that occur for lesser of 15 years or the duration of their PPA contract, if they have one." [137] SEIA/Vote Solar and IREC state that any transition to a new default rate design should occur gradually in order to minimize detrimental impacts on the value of existing NEM facilities.[138] Additionally, the substantial baseline credit SEIA/Vote Solar propose to retain in both its TOU rates and its non-TOU inclining block rates should substantially protect NEM/DG customers from bill increases that would occur under un-tiered rates, and should cause little change in the allocation of benefits and costs of NEM/DG between participants and non-participants.

With respect to the effect of rate changes on the incentives to install customer-sited DG in the future, ORA and EDF argue that cost-based TOU rates would continue to incentivize NEM facilities albeit in a manner that reduces cost-shifting and increases the value of NEM facilities to the grid. ORA explains that its "end-state TOU rates will

[137] DECA proposal, 5/29/13, at 21.

[138] SEIA/Vote Solar proposal, 5/29/13, at 23. IREC Comments, 7/12/13 at 15. See, IREC's comments filed January 31, 2014, p.3.

bring rates closer to marginal cost, and thus they will signal more accurately the value of customer-sited generation." [139] Similarly, EDF states:

> Under tiered tariffs, as PV penetration increases over time, DG systems will continue to be compensated at the differential between the upper tier energy prices, regardless of PV's marginal value to the system, providing high financial compensation long after their incremental value to the system has begun to decline. While this will encourage the growth of PV installations, which aids in helping California reach its DG goals, the manner in which the NEM installations are compensated will not reflect their marginal value to the system.[140]

IREC's comments emphasized an important consideration for NEM customers regarding the switch to default TOU rates … the TOU period definitions have a substantial impact on the value of NEM. Additionally, IREC states that TOU period definitions should be made static for a certain period of time, as EDF proposed, to provide NEM customers more stable assumptions on which to base an invest in a NEM system.[141]

The utilities assert that either fixed charges or demand charges are necessary to ensure that NEM customers pay their fair share of fixed costs. For example, SDG&E argues that allowing NEM customers "to avoid fixed customer costs is an arbitrary means to set an incentive level.… Only by providing the incentive separate from basic rates can the incentive be reasonably adjusted over time to enable public policy at the lowest societal cost."[142]

Nearly all other parties opposed the use of fixed or demand-based charges for residential customers, in part due to the reduction in the value of NEM, with IREC providing a detailed analysis by climate zone and PV system size.[143] NRDC offered a compromise solution that seems to be largely based on the "Network Use Charge" proposed by SDG&E in A.11-10-002, which was ruled out of scope by an assigned commissioner's ruling issued January 18, 2012.

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[139] ORA proposal, 5/29/13, at 36.

[140] Ibid, at 23.

[141] See IREC's comments filed January 31, 2014. IREC suggests citing IREC's comments dated July 12, 2013, at 14-15.

[142] SDG&E proposal, 5/29/13, at 29.

[143] Insertion suggested by IREC in comments filed January 31, 2014. IREC suggests adding a citation to its comments dated July 12, 2013 at 11.

After rejecting both a fixed customer charge and a demand charge, NRDC discusses its bi-directional distribution rate concept:
[NEM customers]would be compensated for power they deliver to the utility at those TOU rate blocks for energy, transmission, and *network* distribution. But the NEM customer would have to pay the *local* distribution charge to the utility to cover the portion of the utility's costs in receiving, managing, and re-delivering that power.[144] NRDC concludes that implementation of a local distribution use charge obviates the need for high fixed charges to address NEM customers' underpayments for use of the distribution system.[145]

Another source of cross-subsidy that NRDC does not appear to directly address in its proposed rate design is the interaction of NEM and tiered rates. The inclining block element in NRDC's tiered TOU rates would still allow large users with solar systems to pay only lower-tier rates for their net consumption, averaging about $0.10 per kWh, which may remain well below the cost to serve such customers (even after the small bi-directional distribution charge is added).

**Staff Recommendation on Impact of Rate Design Changes to the Value of NEM Facilities**

Compared to today's rates, the cost-based TOU rate design we propose appropriately supports the development of NEM facilities, provides reasonable value to existing NEM facilities, and reduces the cost born by non-participants. Given the level of cross-subsidy that NEM represents today[146], any cost-based rate design is likely to reduce the current level of support provided to NEM through the rate structure. The ideal rate structure for NEM customers may not be the ideal rate structure for the majority of non-NEM customers. The goal of promoting customer-sited distributed generation is important, but we believe, in accord with rate design principles 2, 3, 8 and 9, that rates should generally reflect costs and that to the extent subsidies are required to continue incentivizing customer adoption of DG, the subsidies should be explicit and transparent.

Staff agrees with parties who argue that reducing the number of tiers or flattening tier differentials will reduce some of the economic value of NEM facilities to participants. On the other hand, there are likely to be current non-participants who would like to "go solar," but cannot justify doing so based on the below-cost rate they are paying for their

[144] NRDC proposal, 5/29/13, at 25.

[145] Ibid, at 27.

[146] "California Net Metering Ratepayer Impact Evaluation", CPUC, October, 2013.

Tier 1 and 2 usage. For this latter group of customers, the economics of distributed energy would improve if the current rate structure were replaced with a non-tiered TOU rate or the number of tiers was reduced and the tier differentials flattened. In the ratesetting process that determines the transitional and end-state new rate structures, the Commission should continue to consider the impact of the new rate structure on the ongoing value of NEM facilities for existing NEM customers. This should be done in coordination with the NEM transition and future NEM policy proceedings. The Commission should consider such impacts in balance with other competing Commission policy objectives.

## 4.6 GHG COSTS IN RESIDENTIAL RATES

Energy Division recommends including IOU Greenhouse Gas (GHG) Cap-and-Trade-related costs in residential rates so that residential customers would begin to see a GHG price signal starting in 2015. The GHG costs should be added on an equal cents per kWh basis to all tiers. With passage of AB 327, the restrictions on increasing Tiers 1 and 2 are removed; therefore the IOU Cap-and-Trade program costs can be embedded in residential rates on a volumetric basis without creating disproportionate rate impacts on upper tier rates. Therefore it is no longer necessary for the Commission to neutralize greenhouse gas costs in all residential rates. Such a decision is very consistent with rate design principles 3 (cost causation) and 9 (encouraging economically efficient decision making.) The anticipated rate impact would be very modest.

Current Commission policy is to use Cap-and-Trade-allowance revenue to eliminate GHG-related costs from residential rates of the three large utilities: PG&E, SCE and SDG&E. However, residential customers of the two smaller utilities, PacifiCorp and Liberty Utilities, will experience a full GHG price signal in rates since these utilities have not been subject to similar restrictions on their ability to allocate costs to rate tiers. This policy to "buy down" the cost of Cap-and-Trade in residential rates is at odds with Commission preference to preserve the carbon price signal in electricity rates, but the Commission stated that an exception in the residential rate class was appropriate at the time given the differences in cost burden that exist in tiered rates[147].

Prior to the passage of AB 327, the burden of GHG costs would have fallen almost exclusively on upper tier rates. The limitations on the Commission's ability to assign additional costs to PG&E, SCE, and SDG&E Tier 1 and 2 rates effectively would prevent

[147] D.12-12-033 Decision Adopting Cap-and-Trade Greenhouse Gas Allowance Revenue Allocation Methodology for The Investor-Owned Electric Utilities, at 113-114.

any Cap-and-Trade-related costs from being reflected in those rates. Therefore, residential customers on lower-tier rates, which represent the vast majority of kWh consumed, would be effectively blind to any carbon price signal and have no incentive to alter electricity consumption as a result of the Cap-and-Trade program, while customers on upper-tier rates would see a disproportionally strong signal.

For the reasons discussed above, in D.12-12-033 the Commission ordered the IOUs to "…neutralize greenhouse gas costs in all residential rates, including time-of-use rates, through the volumetric return of greenhouse gas allowance revenues in an amount equivalent to, and not exceeding, the Cap-and-Trade program costs that are embedded in residential rates."[148] In that same decision, the Commission set out conditions under which it would be appropriate to return a GHG price signal to residential rates [emphasis added]:

> *In electing to offset all Cap-and-Trade-related costs in upper-tier residential rates, however, we wish to underscore that we are only adopting this approach as a result of the disproportionate costs allocated to upper-tier customers under the current tiered residential rate structure, which would be further exacerbated by the inclusion of GHG costs. Should the differences between lower and upper-tier residential rates be substantially reduced or eliminated, it would no longer be appropriate to use allowance revenue for this purpose. In that event, the carbon price signal should be fully reflected in residential rates and all remaining revenue should be returned on a non-volumetric basis as described below.*[149]

With the passage of AB 327, the Commission may modify the rate structure including the number of tiers and the tier differentials subject to certain limitations such as ensuring a reasonable phase-in. More importantly, the restrictions on increasing Tiers 1 and 2 are removed; therefore the IOU Cap-and-Trade program costs can be embedded in residential rates on a volumetric equal cents per kWh basis without creating disproportionate rate impacts on upper tier rates.

[148] D.12-12-033, OP 8.

[149] D.12-12-033 at 114.

### 4.6.1 SUMMARY OF 2014 RESIDENTIAL GHG COSTS AS FORECASTED IN A.13-08-002, ET AL.

The table below illustrates the magnitude of potential rate impacts at issue, based on the most current forecasts available for 2014. The table represents the average GHG costs that are attributable to all bundled residential sales in 2014. These figures represent only forecasted 2014 GHG costs and do not include deferred 2013 GHG costs that will be partially amortized in 2014 electricity rates. These figures rely on public data provided in the proceeding A.13-08-002 et al (GHG Cost and Revenue Forecast Applications), with modifications, where necessary, to illustrate GHG cost impacts on residential sales as a whole, as opposed to impacts on upper tier consumption, which was generally the focus of data provided in A.13-08-002 et al.

**Table 4-6** Forecast 2014 GHG Costs Attributable to Bundled Residential Sales

| Utility | Average Residential GHG Cost ($/kWh) |
|---|---|
| PG&E | $0.00247 |
| SCE[150] | $0.00405 |
| SDG&E | $0.00343 |

[150] SCE's unit GHG cost for residential customers, as provided in A.13-8-002 et al, includes 100% of forecast 2014 GHG costs plus 50% of deferred 2013 GHG costs. To protect 2014 GHG cost forecasts that SCE has classified as confidential, for the purposes of estimating GHG unit costs attributable only to forecast 2014 GHG costs, we assume that 2014 and 2013 GHG costs are equal. Therefore, to isolate the impact of 2014 GHG cost forecasts, we reduce SCE's unit cost forecasts in A.13-08-002 et al by 33%.

# 5 FIXED CHARGES, MINUMUM BILLS, AND DEMAND CHARGES

Currently, SCE, SDG&E and PG&E recover the residential revenue requirement almost entirely through volumetric rates. The IOUs recover a limited amount of fixed costs through either a fixed customer charge (SCE has a $0.94 per month customer charge)[151], or a minimum bill (PG&E and SDG&E have $4.50 and $5 per month minimum bills respectively). A fixed customer charge is a monthly charge applicable to all customers regardless of usage intended to reflect fixed costs of providing utility service that do not change with usage. A minimum bill is a monthly charge intended to recover fixed costs of utility service, but distinct from a customer charge. The minimum bill is a payment calculated based on the applicable volumetric rate. If volumetric usage is so low that the resulting bill would be less than the minimum bill, the customer would have to pay the minimum bill.

Staff believes that either higher minimum bills or a fixed charge for residential customers is consistent with the Commission's rate design principles. The key difference between the two is that with minimum bills, the revenue requirement is still primarily recovered on a volumetric basis. Because relatively few customers (i.e., NEM generators or extremely low users) pay higher bills as a result of minimum bill thresholds, utilities collect little additional revenue to offset volumetric rates through this mechanism.[152] As an example, assume that fixed costs are equal to volumetric costs, all costs are recovered volumetrically (except for any additional revenues collected as a result of minimum bills), fixed costs are $10 per residential customer, and the minimum bill is set at $10. Before the application of the minimum bill, a customer who uses $9 worth of electricity would have contributed $4.50 to variable costs incurred on her behalf and $4.50 to fixed costs. The minimum bill causes her to pay only an additional $1, resulting in a $5.50 payment toward fixed costs.

In contrast, fixed charges are paid first by all customers regardless of usage, and each dollar collected reduces the volumetric rate. In the above example, with a fixed charge of $10 instead of a minimum bill, this customer would have paid $10 in fixed charges and $4.50 in volumetric charges (to cover the variable costs) for a total bill of $14.50.

[151] Correction submitted by SCE in comments filed January 31, 2014, at p.2.

[152] PG&E stated at the June 25, 2013 residential rate design workshop that only 3 percent of its customers are affected by its minimum bill of approximately $4.50 per month.

Each of these approaches advances different principles more than others and each has its trade-offs as discussed below. Staff recommends either option be adopted in the next rate setting proceeding of each utility.

Four parties proposed fixed charges in addition to volumetric tiered, time variant or flat rates: PG&E, SCE, SDG&E and CLECA. The illustrative proposed fixed charges vary considerably, from $5/month for non-CARE customers proposed by CLECA and SCE to $65/month for distribution charges proposed to SDG&E, as shown in Table 5-1 below. SDG&E's proposal is slightly different than the others, in essence proposing either a fixed charge applicable to all customers or a demand-differentiated charge based on the customer's maximum demand during a specified period. All of the parties, including SDG&E, indicate that their proposals are *illustrative* and that they expected the magnitude of any customer fixed charges to be litigated and determined in individual rate cases at some point in the future.

**Table 5-1 Illustrative Fixed Customer Charge and Demand Charge Proposals**

| | **Illustrative Fixed Charge Proposal** | |
|---|---|---|
| **Party** | **Tiered Rate Proposal** | **TOU Rate Proposal** |
| PG&E[153] | Transition<br>Non-CARE: $5 /month<br>CARE: $4/month<br><br>End-State<br>Non-CARE: $10 /month<br>CARE: $8/month | Non-CARE: $10/month<br>CARE: $8/month |
| SCE[154] | Transition and End-State<br>Non-CARE: $5/month<br>CARE: $4/month | Transition<br>Non-CARE: $5-$10/month[155]<br>CARE: $4-8/month<br><br>End-State<br>Non-CARE: $15-$20/month<br>CARE: $12-16/month |

[153] PG&E Illustrative Rates, Attachment 1, July 1, 2013. In addition, PG&E indicates that a "monthly fixed fee could start at a low level and slowly be increased over time toward cost." PG&E Proposal, May 29, 2013, p. 7.

[154] SCE Proposal, May 29, 3013, Appendix A. SCE Illustrative Rate Summary, July 1, 2013, Appendix A.

[155] SCE's illustrative fixed charge is demand-differentiated based on a 5kW demand breakpoint.

| | | |
|---|---|---|
| SDG&E | Flat Demand Charge<br>$0 - $38.24/month<br><br>Demand-Differentiated Charge<br>0 – 3 kW: $15/month<br>3 – 7 kW: $30/month<br>> 7 kW: $65.17/month | |
| CLECA | Minimum of $5/month | |

These four parties make at least three arguments in support of fixed charges. First, they argue that fixed charges are widely utilized by other utilities, including publicly owned electric utilities in California (e.g., City of Riverside, Sacramento Municipal Utilities District, and Pasadena Water and Power, among others), other types of utilities in California (e.g., water, wastewater, and communications), electric and gas utilities throughout the United States. Moreover, they have been adopted for virtually all non-residential customers of SCE, PG&E and SDG&E.[156] SCE notes that fixed charges are common among the top 50 electric investor owned utilities in the U.S. and, even among investor-owned energy utilities in California, the Commission has approved residential fixed charges for Liberty Utilities (formerly Sierra Pacific), PacifiCorp, and SoCalGas.[157]

Second, all of these parties argue that fixed charges should be employed because they appropriately reflect cost causation. For example, PG&E states that "[a] monthly fixed fee to recover fixed costs of utility service is a key tool for fulfilling the very important ratemaking principal of cost causation."[158] PG&E explains that these costs include "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."[159] Similarly, SDG&E contends that "[u]tilities incur customer costs just to maintain a service connection with a customer, and these costs generally do not vary with a customer's demand" and that, "[a]s a result, an accurate price signal would recover these costs through a monthly basic service fee that does not vary with a customer's demand."[160]

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[156] PG&E Proposal, May 29, 2013, p. 17. CLECA Proposal, p. 8.

[157] SCE Proposal, May 29, 2013, pp. 31-35.

[158] PG&E Proposal, May 29, 2013, p. 43.

[159] Id.

[160] SDG&E Proposal, p. 24.

SDG&E also argues that ignoring "cost-causation" results in cross-subsidies that benefit, for example, customers with distributed generation. SDG&E states, "a subsidy that allows a distributed generation technology to avoid fixed customer costs is an arbitrary means to set an incentive level."[161]

Third, at least some of the parties argue that fixed charges will not inhibit investments in energy efficiency and distributed generation. PG&E contends that fixed fees that reduce volumetric rates will not inhibit conservation because customers respond to average price signals and lower tier customers will have increased incentive to conserve, although upper tier, higher usage customers will have reduced incentive to conserve. CLECA suggests that volumetric rates shifts costs to larger users, and that "[f]acing prices above costs does not lead to economically efficient decision making." SDG&E makes a similar argument as PG&E, noting that "accurate" rates will create incentives "for customers to pursue conservation and energy efficiency efforts that consider production and capacity-related environmental costs" and that if further investments in energy efficiency and conservation are warranted, direct incentives could be adopted (e.g., rebates, etc.).[162] In addition, while conceding that a modest fixed charge (e.g., $5/month) would increase bills for small users, CLECA argues this increase would not represent a dramatic change in terms of an overall bill impact.

Several parties supported minimum charges instead of fixed charges. CforAT indicates that it does not oppose minimum charges in lieu of fixed charges if they do not affect affordability for low usage customers.[163] SDCAN "urges the continued use of minimum bills so that customers who use little or no power contribute to fixed costs but that the vast majority of residential customers do not incur the detriments of fixed price rate design."[164]

One of the main arguments cited against the use of a customer charge is that variable costs may not reflect full external environmental costs to society. Compared to the use of a fixed charge to recover all or a portion of the fixed costs of providing service to residential customers, the volumetric approach exaggerates the energy price signal, which incents more energy efficiency, demand response, and distributed generation than the lower volumetric rates that would result from the use of fixed customer

[161] SDG&E Proposal, p. 29.

[162] SDG&E Proposal, pp. 30-31.

[163] CforAT Proposal at 35.

[164] SDCAN Proposal at 1.

charges. However, in California electricity generation the cost of emitting most criteria pollutants is already internalized under various state and federal regulations. Regarding GHG emissions, ORA argues that under cap and trade the price of GHG will also be captured in the marginal energy cost and thus in rates, but in reality that has not occurred yet for residential rates.[165] Thus ORA concludes:

> … it is probably better from a societal economic efficiency perspective, for volumetric rates to err on the high side, as long as low-income and baseline protections are sustained, even if over-conservation should result.[166]

On that basis, ORA opposes inclusion of a customer charge in rates since customer charges would reduce customers' incentives to conserve.

The utilities argue that rates with fixed customer charges would promote only "cost-effective" reductions in energy usage. In other words, purely volumetric rates may be encouraging usage reductions that are not cost-effective from a total social cost perspective.

We note that to the extent that low-income customers are also low usage customers, they would be impacted by the implementation of fixed charges. The magnitude of this effect would depend on the size of any fixed charge that is imposed and what other rate changes are implemented concurrent with any fixed charges.[167] However, customers who use large amounts of electricity for medical needs may benefit from the reduction in volumetric rates due the use of fixed charges.

To some extent, the choice between the use of fixed charges or minimum bills entails a trade-off between equity and conservation. When utilities collect fixed charges volumetrically, high usage customers will overpay for their share of fixed costs and vice versa. In general, usage correlates with climate, number of occupants, dwelling size, and income. Therefore, use of fixed charges will tend to reduce the cross-subsidy that currently exists as a result of customers in hot climate zones overpaying for fixed

[165] As discussed above in Section 4.6, the Commission signaled its intent to pass GHG costs through in residential rates in D.12-12-033.

[166] ORA Proposal at 32.

[167] AB 327 limits the fixed charge for CARE customers to a maximum of $5 per month.

costs.[168] In contrast, eschewing the use of fixed charges is more likely to encourage energy efficiency, demand response, and distributed generation in support of state climate goals and other policy objectives, although there is some risk that customers will "over-invest" in measures that are not cost-effective in the absence of an exaggerated volumetric price signal.

The Commission has chosen each of these paths in the past. In D.96-04-050, referenced by SCE in its filings, the Commission cited a series of decisions in which it opted to endorse customer charges, "In the past, we have supported the concept of establishing a customer charge for residential customers, based on arguments that such a charge would provide more accurate price signals to the domestic customer regarding their usage. In particular, we expressed the belief that a customer charge is fairer to customers because it reduces the subsidies built into the current energy charge method of collecting residential customer costs." (1996 WL 104025 (Cal.P.U.C.), 55-56).

In contrast, in D.93887 (1981), the Commission chose a different path, primarily based on its desire to encourage conservation and energy efficiency. In that case, PG&E proposed to eliminate its $1.75 customer charge "in order to send a better conservation signal to customers in the form of more responsive energy charges" and because "the customer charge is a source of confusion and dissatisfaction to customers." In this decision, the Commission found that "[e]nergy charges provide better conservation signals" and that "[t]he residential gas and electric monthly charges should be eliminated," although the Commission instituted minimum charges in their stead to "mitigate the inequitable benefits received by zero usage residences."

Staff recommends one of two options be adopted in the next rate setting proceeding of each utility:

A) Minimum Bill – A minimum bill charge addresses the utilities' concern that customers who are able to net their bills to zero are "free riders" who do not pay for any of the infrastructure that is required to serve them. However, the minimum bill approach allows for the continued recovery of most fixed costs via a volumetric rate that blends the infrastructure and energy costs for the vast majority of residential customers, exaggerating the price signal to encourage adoption of efficiency, demand response, and distributed generation resources consistent with the loading order. Staff proposes that if the minimum residential bill requirement is retained, it be set at least

[168] Borenstein, Severin. "Regional and Income Distribution Effects of Alternative Retail Electricity Tariffs," Energy Institute at Haas Working Paper 225, UC Berkeley, October 2011. http://ei.haas.berkeley.edu/pdf/working_papers/WP225.pdf

equal to the fixed charges permissible under AB 327 beginning in 2015 ($10/month for non-CARE customers and $5/month for CARE customers, thereafter increasing with the rate of inflation).

B) Fixed Charge – Adding a modest fixed customer charge will better align residential rate design with the principle of cost-causation and further reduce some of the cross-subsidies in rates. Large users are paying a disproportionate share of infrastructure costs through volumetric rates while small users are underpaying. If the Commission orders IOUs to adopt a fixed charge, staff recommends that it be gradually introduced given the other rate changes customers will face if the rate design recommendations of this staff report are enacted. Staff proposes that if a fixed charge is adopted that it be phased in by starting at no more than $5 per month, and then increasing annually to $7.50 and then $10. Thereafter it would increase with the rate of inflation.

# 6 CUSTOMER PROTECTIONS

## 6.1 HISTORY OF THE CARE PROGRAM PRIOR TO AB 327

The California Alternate Rates for Energy (CARE) program is a low income energy rate assistance program that dates back to the 1980s and is aimed at providing eligible low income households with a discount on their electric and natural gas bills. The CARE program has evolved over time. The Commission increased the CARE rate discount in 2001 from a minimum of 15% to a minimum of 20% in D.01-06-010. This provision was codified in law and also exempted CARE customers from Department of Water and Power (DWR) charges, California Solar Initiative (CSI) charges, and charges associated with the CARE discount itself. [169] The Commission also changed the eligibility criteria in D.01-03-082 and D.01-06-010, increasing it from 150 percent of the federal poverty level to 175 percent of the federal poverty level. In 2005 (D.05-10-044), the Commission further revised the eligibility criteria for CARE from 175 percent of the federal poverty guidelines to 200 percent, primarily because of concerns regarding exceptionally high gas prices expected during the winter of 2005 - 2006.[170] These revised eligibility criteria were subsequently codified in law[171] and updated consistent with federal poverty guidelines.

Based in part on the changes to the eligibility requirements, the recession, and outreach efforts, the number of CARE customers served by the program and the cost of the program has increased over time, as illustrated in Tables 13 and 14.

Current CARE and non-CARE rates are shown in Table 6-1. Because CARE Tier 1 and 2 rates have effectively remained frozen since the energy crisis, these rates are

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[169] These parameters were specified in the California Public Utilities Code Section 739.1(b)(4): "Tier 1, tier 2, and tier 3 CARE rates shall not exceed 80 percent of the corresponding tier 1, tier 2, and tier 3 rates charged to residential customers not participating in the CARE program, excluding any Department of Water Resources bond charge imposed pursuant to Division 27 (commencing with Section 80000) of the Water Code, the CARE surcharge portion of the public goods charge, any charge imposed pursuant to the California Solar Initiative, and any other charge imposed to fund a program that exempts CARE participants from paying the charge…."

[170] This decision made a number of other changes as well, allowing CARE customers to enroll by phone, directing the utilities to improve their levelized payment plans, etc.

[171] "The Commission shall establish a program of assistance to low-income electric and gas customers with annual household incomes that are no greater than 200 percent of the federal poverty guideline levels, the cost of which shall not be borne solely by any single class of customer." California Public Utilities Code Section 739.9(b)(1).

substantially below the non-CARE Tier 1 and 2 rates. Moreover, the CARE Tier 3 rates are even lower, in percentage terms, because CARE Tier 3 rates have been set administratively (for PG&E) or through settlement agreements (for SDG&E) -- only in SCE's case is the rate set at 20 percent of the otherwise applicable rate, with the additional exclusions mandated by law (e.g., DWR bond charges and CSI program and CARE surcharge expenditures). As a result of these restrictions, the CARE rate discount is greater than the statutorily mandated 20 percent discount, and varies from roughly 35 percent in the case of SCE and SDG&E and approximately 47 percent for PG&E.

**Table 6-1 CARE and Non-CARE Customers, 2001 - 2012**[172]

| | PG&E | | SCE | | SDG&E | |
|---|---|---|---|---|---|---|
| Year | CARE | Non-CARE | CARE | Non-CARE | CARE | Non-CARE |
| 2001 | 400,000 | 3,940,000 | 625,000 | 3,910,000 | 133,233 | 965,941 |
| 2002 | 560,000 | 3,830,000 | 753,000 | 3,960,000 | 148,526 | 970,285 |
| 2003 | 650,000 | 3,920,000 | 843,000 | 4,010,000 | 161,871 | 975,642 |
| 2004 | 730,000 | 3,800,000 | 919,000 | 4,000,000 | 171,601 | 984,045 |
| 2005 | 800,000 | 3,800,000 | 937,000 | 4,070,000 | 183,972 | 990,159 |
| 2006 | 940,000 | 3,720,000 | 1,016,000 | 4,064,000 | 197,393 | 992,100 |
| 2007 | 970,000 | 3,750,000 | 1,006,000 | 4,190,000 | 209,365 | 991,120 |
| 2008 | 950,000 | 3,790,000 | 1,025,000 | 4,100,000 | 221,271 | 986,359 |
| 2009 | 1,020,000 | 3,730,000 | 1,133,000 | 4,050,000 | 243,022 | 971,734 |
| 2010 | 1,230,000 | 3,530,000 | 1,278,000 | 3,990,000 | 269,488 | 952,450 |
| 2011 | 1,300,000 | 3,480,000 | 1,380,000 | 4,180,000 | 287,177 | 941,329 |
| 2012 | 1,280,000 | 3,530,000 | 1,387,000 | 4,330,000 | 293,314 | 941,781 |

**Table 6-2 CARE Discount ($Million per Year), 2001 - 2012**[173]

| Year | PG&E | SCE | SDG&E |
|---|---|---|---|
| 2001 | $30 | $69 | $13 |
| 2002 | $80 | $97 | $19 |
| 2003 | $130 | $116 | $21 |
| 2004 | $150 | $178 | $23 |
| 2005 | $190 | $173 | $24 |
| 2006 | $220 | $212 | $31 |

[172] ORA states: Tables 6-1 and 6-2 of the Staff Proposal contain data which differs significantly from existing publicly reported CARE data, and cites CARE Annual Reports: CARE Table 8 (participation), CARE Table 1 (costs). See, ORA Comments filed January 31, 2014, p.3.

[173] Data requests, PG&E, SCE and AB 67 report for SDG&E.

| | | | |
|---|---|---|---|
| 2007 | $380 | $202 | $32 |
| 2008 | $390 | $199 | $38 |
| 2009 | $390 | $228 | $53 |
| 2010 | $520 | $275 | $65 |
| 2011 | $720 | $309 | $85 |
| 2012 | $790 | $341 | $90 |

**Table 6-3 Current CARE and Non-CARE Rates for PG&E, SCE and SDG&E**

| Utility | CARE | | Non-CARE | |
|---|---|---|---|---|
| | Rate | GWh by Tier | Rate | GWh by Tier |
| PG&E | | | | |
| Tier 1 | 8.3 | 5,368 | 13.2 | 13,193 |
| Tier 2 | 9.6 | 913 | 15.0 | 2,455 |
| Tier 3 | 14.0 | 1,208 | 31.1 | 3,477 |
| Tier 4 | 14.0 | 627 | 35.1 | 1,971 |
| Tier 5 | 14.0 | 507 | 35.1 | 1,421 |
| Wtd. Avg. | 10.0 | | 19.5 | |
| | | | | |
| SCE | | | | |
| Tier 1 | 8.5 | 5,617 | 12.8 | 10,132 |
| Tier 2 | 10.7 | 1,036 | 16.0 | 2,162 |
| Tier 3 | 20.8 | 1,368 | 27.2 | 3,303 |
| Tier 4 | 20.8 | 718 | 31.2 | 2,166 |
| Tier 5 | 20.8 | 348 | 31.2 | 2,284 |
| Wtd. Avg. | 12.0 | | 19.6 | |
| | | | | |
| SDG&E[174] | | | | |
| Tier 1 | 9.9 | 744 | 14.8 | 3,425 |
| Tier 2 | 11.6 | 103 | 17.1 | 670 |
| Tier 3 | 17.0 | 122 | 34.3 | 1,031 |
| Tier 4 | 17.0 | 82 | 36.3 | 1,391 |
| Tier 5 | 17.0 | -- | 36.3 | -- |
| Wtd. Avg. | 11.4 | | 22.7 | |

[SCE's baseline is set at 53% of average for SCE, but at 55% of average for PG&E and SDG&E.]

[174] SDG&E rates are a simple average of the summer and winter rates.

## 6.2 OVERVIEW OF PROPOSALS FOR CARE RATES

In response to the Commission's request for proposals to change residential retail rates if legislative restrictions were lifted, the majority of parties either proposed that the Commission maintain the current CARE rate structure or did not specifically address the CARE rate structure. Several would convert the current effective discount into the required discount. We briefly summarize some of the ideas put forth by these parties: PG&E, SCE, SDG&E, TURN, CLECA, ORA, CforAT/Greenlining, and IREC.

Both SCE and PG&E recommended that CARE rates be set in the GRCs with the aspirational goal of approaching a 20% discount. SCE would consider other options for delivery of CARE discount such as a declining discount for usage in Tiers 2 and 3 or a capped monthly benefit. SDG&E's proposes that current protections for low-income customers be removed from the rates and be provided in a clear and transparent manner, such as through a line item bill credit or an income supplement.

TURN proposes that CARE rates consist of three tiers with the largest discount for the first tier (to promote affordability for basic usage) and declining discounts for the upper tiers. Specifically, TURN proposes CARE rates be calculated by discounting the comparable non-CARE tier 1, 2 and 3 rates by 50%, 30% and 10% respectively.[175] Table 6-4 below illustrates the resulting CARE rates for one possible scenario, using illustrative rates. TURN recommends that the same percentage discounts for each of the tiers apply to all three IOUs.

**Table 6-4 Illustrative CARE Tier Discounts Presented by TURN**

| Tier | Non-CARE Rate | CARE Discount | CARE Rate |
|---|---|---|---|
| Tier 1 | 15 | 50% | 7.5 |
| Tier 2 | 20 | 30% | 14.0 |
| Tier 3 | 25 | 10% | 22.5 |

TURN suggests setting non-CARE and CARE rates with uniform tier ratios for all three IOUs. This would result in the same effective CARE discount across utilities, a benefit that could reduce confusion about the program. TURN also believes that its proposal would enhance conservation signals by sharply increasing the marginal price paid for consumption in excess of 100% and 200% of baseline, while at the same time ensuring

[175] TURN also proposed collapsing Tiers 2 and 3, with the revised Tier 2 encompassing usage between 101% - 200% of baseline usage for all customers -- this would affect TURN's CARE discount proposal.

that basic amounts of electricity remain affordable. Furthermore, under this proposal, TURN explains that CARE customers with low usage would be most protected and those with extremely high levels of usage would realize far smaller discounts than current rates provide. Explaining the lower discount for tier 3 usage, TURN indicates that "[p]roviding only this modest discount would create an economic incentive via rate design for customers to reduce usage through conservation and/or energy efficiency (e.g., by participating in the Energy Savings Assistance Program, which has no cost for participants)."[176] TURN also explains that its proposal avoids the "present result wherein the discount implicitly increases for higher users, who are charged a CARE Tier 3 rate for Tier 4 usage and above."[177]

In its proposal, TURN also discusses two other possible approaches to promoting affordability for CARE customers – "the first approach would segment CARE customers by income and provide a larger set of discounts to the lowest income customers" and the second would involve "[f]ine tuning the CARE program to more strategically promote affordability," possibly including "consideration of local cost of living, in addition to or instead of simply focusing on income level."[178] However, in its proposal, TURN declines to promote either of these approaches due to their complexity, but recommends that the Commission explore both approaches in a later phase of this proceeding or in a future CARE proceeding.

CLECA proposes that the Commission consider a monthly cap on CARE assistance similar to the low-income program implemented by the Sacramento Municipal Utilities District (SMUD). CLECA believes "[t]he current CARE program should be restructured because it incorporates the flawed increasing block rates price structure, provides power below cost, and sends incorrect price signals regarding the cost of electricity to participating consumers." At a minimum, CLECA argues that any assistance should be provided as a separate line item on the bill, which would avoid masking the cost of power for residential customers.

CLECA provides additional details regarding SMUD's low-income program rates, explaining that, for low income customers, SMUD has a smaller fixed charge than for other customers, a declining percentage discount off its otherwise applicable two-tier rate, and a maximum dollar discount each month. In addition, as part of the transition to TOU and CPP rates, SMUD has proposed increasing the percentage discount for that

[176] TURN Proposal, p. 52.

[177] TURN Proposal, p. 52.

[178] TURN Proposal, pp. 54-56.

period of time but decreasing the maximum dollar discount. CLECA reports that SMUD's analysis indicates that half of its customers will see no bill impact from this change, 35 to 40 percent will see lower bills, and only the highest users (over 1100 kWh per month) will see higher bills, the latter of whom will be eligible for special energy efficiency programs.

ORA proposes to maintain the CARE program, with discounts for customers on both TOU and tiered rates. For customers on ORA's long-term default TOU rate proposal, ORA proposes both a 30 to 35 percent CARE discount for eligible customers and 5 cents per kWh credit for usage up to the baseline allowance for all customers both CARE and non-CARE. ORA states in comments: The options for allocating the CARE subsidy should be laid out as following:

- Volumetric discount either applied equally or differentiated (by tier, income level, regional differences, or other factor or combination of factors.)
- Flat dollar amount discount, either applied equally or differentiated (by tier, income level, regional differences, or other factor or combination of factors.[179]

CforAT argues that the discount for CARE customers should not decrease as a result of this proceeding. CforAT notes that while the 20 percent discount has its basis in legislation, the effective discounts have been much larger and CforAT/Greenlining argues that even with effective CARE discounts as high as 47% for PG&E, 31% for SCE and 33% for SDG&E, "energy is not affordable for a significant number of low-income customers."[180] At a minimum, CforAT argues that "the Commission must ensure that bills do not increase significantly for CARE customers."[181]

While maintaining the current discount, CforAT/Greenlining believes that the Commission could consider alternatives to the current CARE rate structure, including increasing assistance to those customers with the lowest income levels. Specifically, CforAT/Greenlining believes that the Commission could consider different levels of discounts for customers at 50%, 100%, 150% and 200% of federal poverty guidelines. In addition, CforAT/Greenlining believes that the Commission could also consider

[179] See, ORA's comments, January 31, 2014, pp.5-6.

[180] CforAT/Greenlining, p. 58.

[181] CforAT/Greenlining, p. 59.

providing higher discounts for basic levels of usage and lower discounts for higher levels of usage.

IREC proposes a new program called Clean CARE, which in concept would achieve equivalent CARE discount through efficiency and renewable programs. Specifically, IREC proposes that a portion of the CARE subsidy be allocated to the development of shared renewables coupled with energy efficiency upgrades and, possibly, demand response and energy storage. The aim would be for this program to achieve the same or better bill discounts for enrollees while also better aligning the CARE program with California's other demand-side management efforts. CARE customers electing the CleanCARE option would be offered energy efficiency improvements to lower their overall energy consumption and bill credits for shared distributed generation that would offset a portion of their monthly bill, with the goal of leaving these customers no worse off, they would be with the traditional CARE rate discount. IREC believes its proposal would bring the benefits of investing in renewable energy to low-income customers and communities, while also retaining the principle of affordable energy for low-income and medical baseline customers.

## 6.3 DISCUSSION OF CARE OPTIONS IN LIGHT OF AB 327 LEGISLATIVE CHANGES

AB 327 makes the follow changes to how CARE rates are determined:

- Requires that the average effective CARE discount be not less than 30 percent or more than 35 percent of the revenues that would have been produced for the same billed usage by non-CARE customers. The average effective CARE discount is defined as the weighted average discounts provided to individual customers. The average effective discount determined by the commission shall reflect any charges not paid by CARE customers.[182]
- Requires that if a utility currently provides a discount greater than 35 percent, the currently effective discount in excess of this amount should be reduced by a reasonable amount on an annual basis.
- Requires that the entire discount be provided in the form of a reduction in the overall bill for the eligible CARE customer.

[182] Including payments for the California Solar Initiative, payments for the self-generation incentive program made pursuant to Section 379.6, payment of the separate rate component to fund the CARE program made pursuant to subdivision (a) of Section 381, payments made to the Department of Water Resources pursuant to Division 27 (commencing with Section 80000) of the Water Code, and any discount in a fixed charge.

In essence, "the amount available to subsidize CARE customers is to be derived by calculating a 30-35 percent discount off the total bills that CARE customers would pay at regular residential rates."[183] AB 327 leaves the Commission some latitude to determine how the 30-35% average discount is applied. In light of the AB 327 legislation, and in response to some of the ideas proposed by parties, this section discusses some of the potential options for implementing the 30-35 percent CARE discount and the potential advantages and disadvantages of these options.

1) **Equal 30-35 Percent Volumetric Discount Off of Each CARE Customer's Bill** - Provide a discount off of the customer's bill at the otherwise applicable rates to ensure an overall discount of approximately 30 to 35 percent.[184]
2) **Volumetric Discount Differentiated by Tier** – The discount would differ by tier, [185](e.g., similar to TURN's proposal for 50 percent, 30 percent and 10 percent discounts for tiers 1, 2 and 3).
3) **Lump Sum Discount for All CARE Customers** (e.g., $25 or $30 per CARE customer, per month).
4) **Discount Differentiated by Income Level** (e.g., higher discounts for those below 100 percent of the federal poverty level and a lower discount for those between 101 – 200 percent).

### 30 TO 35 PERCENT VOLUMETRIC DISCOUNT

Under this option, each CARE customer would receive a 30 to 35 percent discount off of the otherwise applicable bill. Thus, with a 35 percent discount, a CARE customer with a $50 bill under the otherwise applicable rate, would receive a $17.50 discount and CARE customer with a $150 bill would receive a $52.50 discount. All customers would receive the same percentage discount.

This option has a number of advantages. It would be simple to administer, easy to understand, and CARE customers would clearly see the otherwise applicable rate and the magnitude of the discount. In addition, this approach could easily be applied to different tariffs – a tiered or TOU tariff. This approach would also scale the discount somewhat for usage, which would ensure the discount would be larger (in overall

[183] This reflects a correction by ORA. See ORA's comments, January 31, 2014, p.3.

[184] See ORA's comments, January 31, 2014, p.5.

[185] Id.

magnitude) for customers in hot climates with numerous household members, who may use more energy. Because of the current tiered rate structure, however, the scaling would not be exactly proportional because upper tier customers pay substantially more – so the discount for high use provides greater benefit, as is illustrated in Table 17.

The primary disadvantage of this approach is that it would not target the discount to the basic needs of the most vulnerable customers. That is, the discount would be equally applicable on a percentage basis to those CARE customers that fall below 100 percent of federal poverty guidelines and those that fall just below 200 percent and equally applicable to customers using small amounts of electricity for basic needs as those using large amounts. However, the latter concern is mitigated somewhat by the fact that, at least currently, tier 1 and tier 2 rates are below average, as demonstrated in the table below.

**Table 6-5** Illustrative Monthly Summer Bill for "Low" Use and "High" Use Customer with 33 Percent Across-the-Board Discount and Current Tiered Rates

| | "Low" Use CARE Customer | | | "High" Use CARE Customer | | |
|---|---|---|---|---|---|---|
| | Rate | Usage | Bill | Rate | Usage | Bill |
| Tier1 | 12.7 | 303 | $38.48 | 12.7 | 303 | $38.48 |
| Tier 2 | 16.0 | 91 | $14.56 | 16.0 | 91 | $14.56 |
| Tier 3 | 27.2 | 0 | $0 | 27.2 | 212 | $57.66 |
| Tier 4 | 31.2 | 0 | $ | 31.2 | 100 | $31.20 |
| Total | | 394 | $53.04 | | 706 | $141.90 |
| Discount | | | $17.50 | | | $49.67 |
| Bill | | | $35.54 | | | $92.23 |
| Avg. Rate | | | 9.02 | | | 13.06 |

There is, however, one implementation issue associated with this method of discount for PG&E. Currently, PG&E's CARE discount is about 35 percent for tiers 1 and 2, but approaches 60 percent for tier 3 usage; that is, the current CARE tier 3 (and tier 4) rate is 14 cents per kWh versus the otherwise applicable rates of 31 and 35 cents per kWh for non-CARE tier 3 and tier 4 usage. The legislation specifies that the average effective discount must be reduced to 30 to 35 percent by a reasonable percentage annually. PG&E's currently effective discount is 47 percent. If it were reduced, for example, to 45 percent on an across-the-board basis, this would mean, in effect, that the discount would increase for tier 1 and 2 usage, only to subsequently decrease over time. It seems that this could prove problematic, providing a new benefit that would then be scaled back over time. Moreover, this could lead to considerable rate shock to CARE customers with tier 3 usage, with the effective discount decreasing from nearly 60 percent down to

45 percent. Thus, it may make sense to first decrease the CARE tier 3 discount over time, before implementing an across-the-board CARE discount mechanism in the manner proposed in this section.

### VOLUMETRIC DISCOUNT DIFFERENTIATED BY TIER

Under this option, the CARE discount would be differentiated by tier, as proposed, for example, by TURN. This would comply with the legislative mandate if the discount for all CARE customers averaged between 30 and 35 percent. For this to occur, it would require adjustments to TURN's proposal (e.g., it may require discounts of 50, 20, and 10 percent vs. TURN's proposal of 50, 30, and 10 percent on its illustrative rates 3-tier rates) or different percentages depending upon the number of tiers in effect at any time (e.g., 4, 3 or 2 tiers).

The primary advantages of this proposal are, as explained by TURN, that it could enhance conservation signals by sharply increasing the marginal price paid for consumption in excess of 100% and 200% of baseline, while at the same time ensuring that basic amounts of electricity remain affordable.

The primary disadvantages are that it could be somewhat complex to administer and explain, especially if the Commission is required to provide the discount as an overall discount on the bill. No one customer would have the same effective discount at any time, and it would be difficult for most customers to predict or understand the discount calculation. Finally, there could be some self-selection bias if this type of structure (i.e., declining discounts) applied to CARE customers on tiers, but an across-the-board discount applied to CARE customers on non-tiered rate structures (i.e., assuming side-by-side tiered and non-tiered rates).

### LUMP SUM DISCOUNT FOR ALL CARE CUSTOMERS

Another option identified by Energy Division staff would be to apply a fixed discount to all CARE customers – for example, a discount of $30 to $35 each month for CARE customers, assuming an average bill of approximately $100. Such an approach would be simple to understand and easy to administer and would provide a larger relative discount for those CARE customers that consume very little amounts of energy and a much smaller discount for larger customers. Moreover, such an approach could be more economically efficient by separating the discount from the pricing, and thus ensuring that customers make consumption and conservation decisions based on price

signals that more closely represent marginal costs, rather than being faced with discounted price signals.[186] This will tend to result in an inefficient level of overconsumption by CARE households.[187] As a practical example, discounted rates render many energy efficiency measures non-cost effective for CARE customers that are cost-effective for non-CARE customers. Implementing the discount as a fixed, lump sum payment would provide low income households with a form of income assistance while preserving more accurate price signals that reflect true cost to serve.

The primary disadvantage of this approach is that it does not automatically adjust for factors that increase consumption such as having a large household and/or living in a hot region. The IOUs could adjust the discount by climate regions relatively easily, with larger discounts for those in hotter climate regions, but it would be considerably more problematic to adjust the discount for the number of residents in each CARE household, as this would be difficult to verify and could change over time.

### DISCOUNT DIFFERENTIATED BY INCOME LEVEL

Yet another option would be to differentiate the CARE discount, whether provided volumetrically or on a lump sum basis, by income level, as was discussed by a number of parties in their May 29th proposals. The primary advantage of this approach is that it would ensure that the most vulnerable customers who are most in need would receive larger discounts compared to other CARE customers with higher income levels. The IOUs could implement this by providing a base discount for all CARE customers and a steeper discount (or discounts) for customers that verify income below 100 percent of the federal poverty guideline and/or other thresholds. The primary disadvantage is that such a program could be costly, cumbersome and complex to administer because it could require more complete income verification, rather than relying on the current self-certification and selective audit approach. Moreover, this approach could exclude vulnerable customers who are unable to satisfactorily verify income eligibility.

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[186] ORA disagrees, in part, stating:" While a lump-sum discount is the approach most divorced from prices, the other approaches also require a separation of the discount from the pricing. … No discount will be purely tied to rates and usage as it has been historically. It will depend on the new considerations of number of customers enrolled in CARE and the level of consumption of CARE customers. Secondly, any CARE discount can be presented on bills separately as a lump-sum, regardless of how it is calculated. See, ORA Comments filed January 31, 2014, pp.2-3.

[187] ORA also takes issue with this statement, pointing out that there is some evidence to the contrary. See, ORA Comments filed January 31, 2014, p.3.

## STAFF RECOMMENDATION FOR CARE DISCOUNT METHOD

Staff believes these four options merit further analysis and deliberation among parties in a subsequent phase of this proceeding. In the short-term, the first option – 30-35 volumetric percent discount applied to each CARE bill - is probably the most prudent and practical approach. It is the simplest to administer and among the simplest to understand. However, to a greater extent than other alternatives,[188] the lump sum payment options have a benefit of separating the CARE discount from the pricing, which will encourage customers to make consumption and conservation decisions based on price signals that more closely represent marginal costs. (See rate design principles 2, 3, 4 and 9.)

[188] See ORA comments, January 31, 2014, p.2, ORA states: "…any CARE discount can be presented on bills separately as a lump-sum, regardless of how it is calculated."

# APPENDIX A: BILL CALCULATOR MODEL RESULTS FOR ENERGY DIVISION'S ILLUSTRATIVE PROPOSED RATES

## Methods and Assumptions

Staff utilized PG&E's and SCE's bill impact models developed for this proceeding[189] to generate illustrative rates and associated bill impacts for Non-CARE and CARE customers for three proposed rate design scenarios:

- 2015 Transitional default 3-tier
- 2018 End-state default un-tiered TOU
- 2018 End-state optional 2-tier

Since the PG&E and SCE models utilize marginal costs and cost allocation factors, billing determinants, and TOU periods from current or recent GRCs to generate proposed rates they are illustrative rather than predictive[190]. Illustrative bill impacts are defined as the change in the customer's bill relative to the current residential default non-TOU four-tiered inclining block rate design and can be measured as either the percent difference, expressed in percent (%), or the absolute difference, expressed in dollars ($), between baseline and proposed customer bills.

Note that customers' transition to future rate designs will occur over multiple years. Therefore, illustrative model results do not represent average annual rate and bill impacts but rather total rate and bill impacts if a customer were to switch to an alternative rate design (i.e. 3-tier, 2-tier or TOU rate design). Because of this limitation in the models the bill impacts appear overstated if viewed as a transition in a single year. In actuality they should be viewed as the impact that would occur over 3 years

[189] Since the SDG&E model only allowed users to apply on-peak, part-peak and off-peak ratios and CARE discounts to the commodity rate rather than the total rate, staff opted not to utilize the SDG&E model to generate illustrative rates and bill impacts.

[190] Illustrative rates and bill impacts are based on model inputs (i.e. billing determinants, revenue requirements, and marginal costs) utilized to generate 2012 PG&E or 2012 SCE GRC rates. In order to predict actual rates and bill impacts in future timeframes, the most current costs, revenues, and load forecasts will need to be utilized in GRC models.

from 2012 to 2015 for the 3-tier transitional rate; and over 6 years from 2012 to 2018 for the end-state rates.

**Illustrative Rate Design Inputs**

PG&E and SCE model inputs utilized to generate illustrative rates and bill impacts in this section are described below.

Effective CARE discount

To address the AB 327 statutory mandate requiring that 2014-18 CARE customer bill impacts are minimized, staff set PG&E's effective CARE discount for the transitional 3-tier rate design scenario at 41%. This is the starting point of a gradual downward glide path of PG&E's current 47% CARE discount toward the required statutory range of 30-35 percent by 2018 Staff used an effective 35 percent CARE discount for PG&E's end-state rate designs, and for SCE in transitional and end-state years.[191]

Tier Inputs

In the transitional 3-tier rate design scenario, staff collapsed Tiers 2 and 3 into Tier 2 and increased Tier 1 rates by 10% and Tier 2 rates by 45%. Staff set Tier 1 at 0-100% of baseline consumption, Tier 2 at 101-200% of baseline consumption and Tier 3 at above 200% of baseline consumption.

In the end-state optional 2-tier rate design scenario, staff collapsed Tiers 2, 3, and 4 into Tier 2, and set Tier 2 rates at 20% above Tier 1 rates. Staff set Tier 1 at 0-100% of baseline consumption, Tier 2 at greater than 100% of baseline consumption.

Minimum Bill or Fixed Charges

In order to provide a conservation incentive, staff utilized a $5 Non-CARE or a $3.3 CARE minimum bill versus a fixed charge for each SCE rate design scenario and PG&E

[191] In its comments filed January 31, 2014, SCE requests that a footnote be added to explain that the SCE models used by the Energy Division did *not* include DWR and CSI charges that CARE customers do not pay. Accordingly, inputting an effective 35 percent discount into the model, under those assumptions, actually results in a higher average effective discount than is permitted under AB 327. (SCE's user manual explained this feature of the models.)

end-state rate design scenarios. For PG&E's transitional default 3-tier rate design, a $3.1 CARE minimum bill was calculated by PG&E's bill impact model.

TOU On-Peak to Off-Peak Ratios

PG&E and SCE TOU summer on-peak to off-peak ratios were set at 2.5 and summer/winter part peak to off peak ratios were set at 1.5.

Average Monthly Customer Consumption

Bill calculator kWh data was obtained from the following sources: PG&E's 2009 California Residential Appliance Saturation Survey (RASS) and 2011 consumption data[192] and SCE's 2011 recorded usage for residential customer sample.[193]

**Results**

**A. Rate Impacts**

Tables 7-1 thru 7-5 respectively illustrates electric rate impacts for PG&E and SCE Non-CARE and CARE customers that transition to either a 3-tier rate structure in 2015 or a 2-tier rate structure from a 4-tier rate structure in 2018. As described earlier, these results do not reflect the expected rates that would be proposed or approved by the Commission. However, they do allow for a comparison of the relative rate impact for customers that transition to 3-tier, TOU or 2-tier rate designs[194].

As explained previously, the transitional default 3-tier rate design would collapse Tier 2 and Tier 3 in the current rate design. However, to facilitate comparison of the new rate designs with the current rates, the tiers in the rate tables below are presented based on current tier usage definition. Current tier structure is as follows:

☐ Tier 1 is for usage up to 100% baseline,

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[192] PG&E RROIR Rate Design and Bill Impact Analysis Model User Guide Version 9.0 3/26/ FINAL,

[193] SCE Residential Rate OIR Rate Design and Bill Impact Analysis Model, User Reference Model March 13, 2013 at 12

[194] Tier rate differentials and changes reflect lower tier rate increases and upper tier rate decreases to accomplish tier consolidation in 3-tier or 2-tier rate designs. (i.e. Tier 1 and 2 rates increase and Tier 3 rates decrease in order to consolidate Tiers 2 and 3 in a 3-tier rate design. Tier 1 rates increase and Tiers 2-4 rates decrease in a 2-tier rate design.)

☐ Tier 2 covers usage above 100% up to 130%,
☐ Tier 3 includes usage above 130% up to 200%,
☐ Tier 4 is for usage above 200% up to 300%, and,
☐ Tier 5 is for usage greater than 300%.

As shown, the transitional default 3-tier rate designs have identical Tier 2 and Tier 3 rates. This is because the usage for the current Tier 2 and Tier 3 (between 100% to 200%) has been combined to form the new Tier 2 usage. Similarly usage above 200% of baseline, previously part of Tier 4 usage, is now part Tier 3.

**Table 7-1** Illustrative Electric Rate Impacts – PG&E 2015 Transitional Default 3-Tier

| PG&E | July 1, 2012 Rates (c/kWh) | Rate Differential | Weighted Average T2 & T3 Rate | Transitional Default 3-Tier Rates (c/kWh) | Rate Differential | % Change from July 1, 2012 Rates |
|---|---|---|---|---|---|---|
| **Non-CARE** | | | | | | |
| **Tier 1 (0-100%)** | 12.8 | 1.0 | | 14.1 | 1.0 | 9.8% |
| **Tier 2 (101-130%)** | 14.6 | 1.1 | 23.2 | 21.2 | 1.5 | -8.6% |
| **Tier 3 (131-200%)** | 29.6 | 2.3 | 23.2 | 21.2 | 1.5 | -8.6% |
| **Tier 4 (>200%)** | 33.6 | 2.6 | | 30.6 | 2.2 | -8.8% |
| | | | | | | |
| **Minimum Bill ($/mo.)** | 4.5 | | | 5.0 | | |
| | | | | | | |
| **CARE** | | | | | | |
| **Tier 1 (0-100%)** | 8.3 | 1.0 | | 8.8 | 1.0 | 5.8% |
| **Tier 2 (101-130%)** | 9.6 | 1.1 | 11.2 | 13.1 | 1.5 | 17.0% |
| **Tier 3 (131-200%)** | 12.5 | 1.5 | 11.2 | 13.1 | 1.5 | 17.0% |
| **Tier 4 (>200%)** | 12.5 | 1.5 | | 19.0 | 1.5 | 52.0% |
| | | | | | | |
| **Minimum Bill ($/mo.)** | 3.6 | | | 3.3 | | |

## Table 7-2 Illustrative Electric Rate Impacts – PG&E 2018 End-State Optional 2-Tier

| PG&E | July 1, 2012 Rates (c/kWh) | Rate Differential | Weighted Average T2-T4 Rate | End-State Optional 2-Tier Rates (c/kWh) | Rate Differential | % Change from July 1, 2012 Rates |
|---|---|---|---|---|---|---|
| Non-CARE | | | | | | |
| Tier 1 (0-100%) | 12.8 | 1.0 | | 17.0 | 1.0 | 32.3% |
| Tier 2 (101-130%) | 14.6 | 1.1 | 25.7 | 20.4 | 1.2 | -20.6% |
| Tier 3 (131-200%) | 29.6 | 2.3 | 25.7 | 20.4 | 1.2 | -20.6% |
| Tier 4 (>200%) | 33.6 | 2.6 | 25.7 | 20.4 | 1.2 | -20.6% |
| | | | | | | |
| Minimum Bill ($/mo.) | 4.5 | | | 5.0 | | |
| | | | | | | |
| CARE | | | | | | |
| Tier 1 (0-100%) | 8.3 | 1.0 | | 11.2 | 1.0 | 34.7% |
| Tier 2 (101-130%) | 9.6 | 1.1 | 11.5 | 13.5 | 1.2 | 17.4% |
| Tier 3 (131-200%) | 12.5 | 1.5 | 11.5 | 13.5 | 1.2 | 17.4% |
| Tier 4 (>200%) | 12.5 | 1.5 | 11.5 | 13.5 | 1.2 | 17.4% |
| | | | | | | |
| Minimum Bill ($/mo.) | 3.6 | | | 3.3 | | |

## Table 7-3 Illustrative Electric Rate Impacts – SCE 2015 Transitional Default 3-Tier

| SCE | 2012 GRC Rates (c/kWh) | Rate Differential | Weighted Average T2 & T3 Rate | Transitional Default 3-Tier Rates (c/kWh) | Rate Differential | % Change from 2012 GRC Rates |
|---|---|---|---|---|---|---|
| Non-CARE | | | | | | |
| Tier 1 (0-100%) | 13.0 | 1.0 | | 14.9 | 1.0 | 14.6% |
| Tier 2 (101-130%) | 16.0 | 1.2 | 22.7 | 22.4 | 1.5 | -1.3% |
| Tier 3 (131-200%) | 27.1 | 2.1 | 22.7 | 22.4 | 1.5 | -1.3% |
| Tier 4 (>200%) | 31.1 | 2.4 | | 29.3 | 2.0 | -5.8% |
| | | | | | | |
| Minimum Bill ($/mo.) | | | | 5.0 | | |
| Customer Charge ($/mo.) | 0.88 | | | | | |
| CARE | | | | | | |
| Tier 1 (0-100%) | 8.5 | 1.0 | | 8.8 | 1.0 | 3.5% |
| Tier 2 (101-200%) | 10.7 | 1.3 | 16.5 | 13.7 | 1.6 | -17.0% |
| Tier 3 (>200%) | 20.7 | 2.4 | 16.5 | 13.7 | 1.6 | -17.0% |
| Tier 4 (>200%) | 20.7 | 1.9 | | 18.1 | 2.1 | -12.6% |
| | | | | | | |
| Basic Charge ($/mo.) | | | | 3.3 | | |
| Customer Charge ($/mo.) | 0.70 | | | | | |

**Table 7-4** Illustrative Electric Rate Impacts – SCE 2018 End-State Optional 2-Tier

| SCE | 2012 GRC Rates (c/kWh) | Rate Differential | Weighted Average T2-T4 Rate | End-State Optional 2-Tier Rates (c/kWh) | Rate Differential | % Change from 2012 GRC Rates |
|---|---|---|---|---|---|---|
| **Non-CARE** | | | | | | |
| **Tier 1 (0-100%)** | 13.0 | 1.0 | | 17.9 | 1.0 | 37.7% |
| **Tier 2 (101-130%)** | 16.0 | 1.2 | 26.2 | 21.5 | 1.2 | -17.9% |
| **Tier 3 (131-200%)** | 27.1 | 2.1 | 26.2 | 21.5 | 1.2 | -17.9% |
| **Tier 4 (>200%)** | 31.1 | 2.4 | 26.2 | 21.5 | 1.2 | -17.9% |
| | | | | | | |
| **Minimum Bill ($/mo.)** | | | | 5.0 | | |
| **Customer Charge ($/mo.)** | 0.88 | | | | | |
| **CARE** | | | | | | |
| **Tier 1 (0-100%)** | 8.5 | 1.0 | | 10.8 | 1.0 | 27.1% |
| **Tier 2 (101-200%)** | 10.7 | 1.3 | 17.9 | 13.1 | 1.2 | -26.8% |
| **Tier 3 (>200%)** | 20.7 | 2.4 | 17.9 | 13.1 | 1.2 | -26.8% |
| **Tier 4 (>200%)** | 20.7 | 1.9 | 17.9 | 13.1 | 1.2 | -26.8% |
| | | | | | | |
| **Minimum Bill ($/mo.)** | 0.70 | | | 3.3 | | |
| **Customer Charge ($/mo.)** | | | | | | |

**Table 7-5** Illustrative Electric Rates – PG&E and SCE 2018 End-State Default TOU

| | PG&E End-State Default TOU Rates (c/kWh) | On Peak or Part Peak / Off Peak Ratio | SCE End-State Optional 2-Tier Rates (c/kWh) | On Peak or Part Peak / Off Peak Ratio |
|---|---|---|---|---|
| **Non-CARE** | | | | |
| **Summer On-Peak** | 36.8 | 2.5 | 40.6 | 2.5 |
| **Summer Part-Peak** | 22.0 | 1.5 | 24.3 | 1.5 |
| **Summer Off-Peak** | 14.7 | N/A | 16.2 | N/A |
| | | | | |
| **Winter Part-Peak** | 17.6 | 1.2 | 21 | 1.5 |
| **Winter Part-Peak** | 14.7 | | 14 | |
| | | | | |
| **Minimum Bill ($/mo.)** | 5.0 | | | |
| **Customer Charge ($/mo.)** | | | 0.88 | |
| **CARE** | | | | |
| | | | | |
| **Summer On-Peak** | 23.5 | 2.5 | 25.5 | 2.5 |
| **Summer Part-Peak** | 14.1 | 1.5 | 14.9 | 1.5 |
| **Summer Off-Peak** | 9.4 | N/A | 9.7 | N/A |
| | | | | |
| **Winter Part-Peak** | 11.3 | 1.2 | 12.8 | 1.6 |
| **Winter Part-Peak** | 3.3 | N/A | 8.2 | N/A |
| | | | | |
| **Minimum Bill ($/mo.)** | 3.3 | | | |
| **Customer Charge ($/mo.)** | | | 0.70 | |

## B. Bill Impacts

### PG&E Transitional Default 3-Tier Non-CARE

Figure 7-1 indicates that 31% of PG&E Non-CARE customers may experience a bill reduction, 67% may experience a 0-15% increase, and 1% may experience a 15-20% increase. Approximately 31% of customers could experience a bill decrease and 68% could experience a $0-$10 bill increase according to Figure 7-2.

**Figure 7-1** % Bill Impacts - PG&E Transitional Default 3-Tier Non-CARE Customers

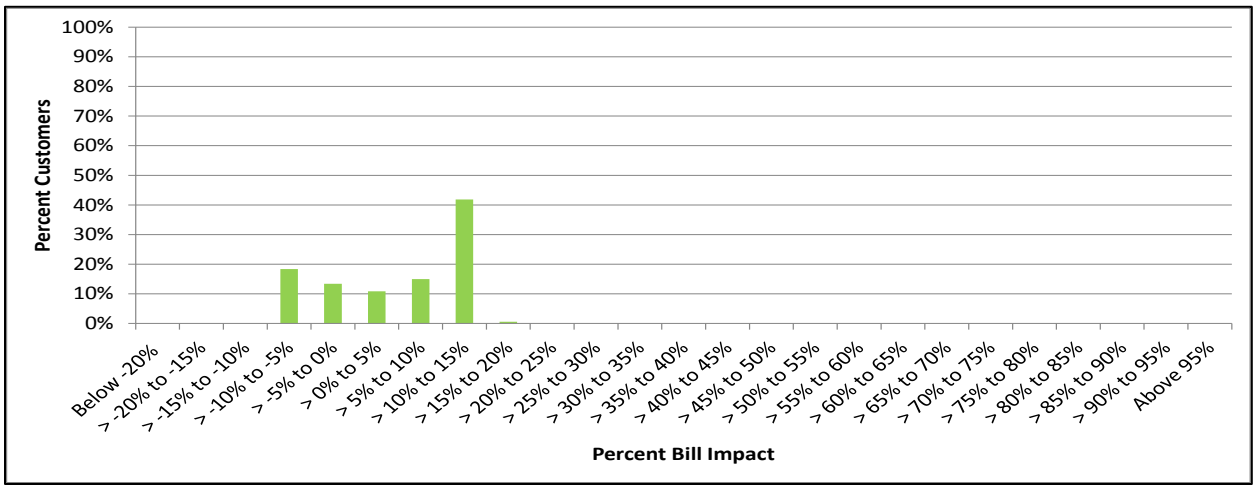



**Figure 7-2** $ Bill Impacts - PG&E Transitional Default 3-Tier Non-CARE Customers

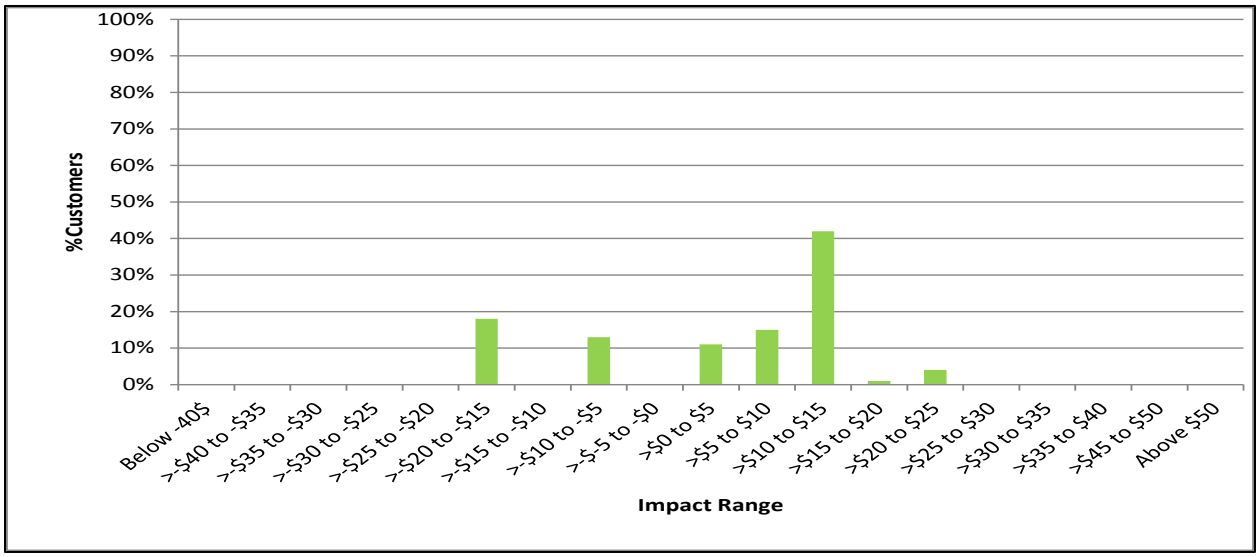


**Table 7-6** Rate Design Impacts - PG&E Transitional Default 3-Tier Non-CARE Customers

| Non TOU 3-Tier Rate Design Impacts | | | NonCARE Customers | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Impact | Customer | | Average | | Average Cents/kWh | | % | Monthly $ | | | Average Bill to Income Ratio | |
| Percent Range | Number | Percent | Monthly - kWh | Load Factor | Jul-12 | Proposed | Change | Jul-12 | Proposed | Change | Jul-12 | Proposed |
| Below -20% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > -20% to -15% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > -15% to -10% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > -10% to -5% | 615,659 | 18% | 997 | 16% | 23.36 | 21.64 | -7% | 232.91 | 215.83 | (17.09) | 2.5% | 2.3% |
| > -5% to 0% | 448,752 | 13% | 687 | 14% | 18.55 | 18.03 | -3% | 127.51 | 123.96 | (3.55) | 1.6% | 1.6% |
| > 0% to 5% | 363,740 | 11% | 602 | 14% | 16.36 | 16.75 | 2% | 98.47 | 100.80 | 2.33 | 1.3% | 1.3% |
| > 5% to 10% | 501,372 | 15% | 439 | 13% | 14.78 | 15.88 | 7% | 64.86 | 69.66 | 4.80 | 0.8% | 0.9% |
| > 10% to 15% | 1,403,974 | 42% | 292 | 11% | 13.26 | 14.78 | 11% | 38.78 | 43.21 | 4.43 | 0.6% | 0.7% |
| > 15% to 20% | 20,052 | 1% | 345 | 16% | 13.32 | 15.39 | 16% | 45.92 | 53.07 | 7.15 | 0.9% | 1.0% |
| > 20% to 25% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 25% to 30% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 30% to 35% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 35% to 40% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 40% to 45% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 45% to 50% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 50% to 55% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 55% to 60% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 60% to 65% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 65% to 70% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 70% to 75% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 75% to 80% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 80% to 85% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 85% to 90% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 90% to 95% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| Above 95% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| Group Total | 3,353,549 | 100% | 530 | 13% | 18.23 | 18.09 | -1% | 96.71 | 95.97 | (0.74) | 1.3% | 1.3% |

**PG&E Transitional Default 3-Tier CARE**

Figure 7-3 indicates that approximately 1% may experience a bill reduction, 85% may experience a 0-15% bill increase, 12% may experience a 15-30% bill increase, and 2% may experience a 30-40% increase according to Figure xx. 1% of customers could experience a bill decrease, 85% of customers could experience a $0-$10 bill increase, 7% of customers could experience a $10-$20 bill increase, 4% of customers could experience a $20-$30 bill increase and 3% of customers could experience a bill increase above $30 according to Figure 7-4.

**Figure 7-3** % Bill Impact - PG&E Transitional Default 3-Tier CARE Customers

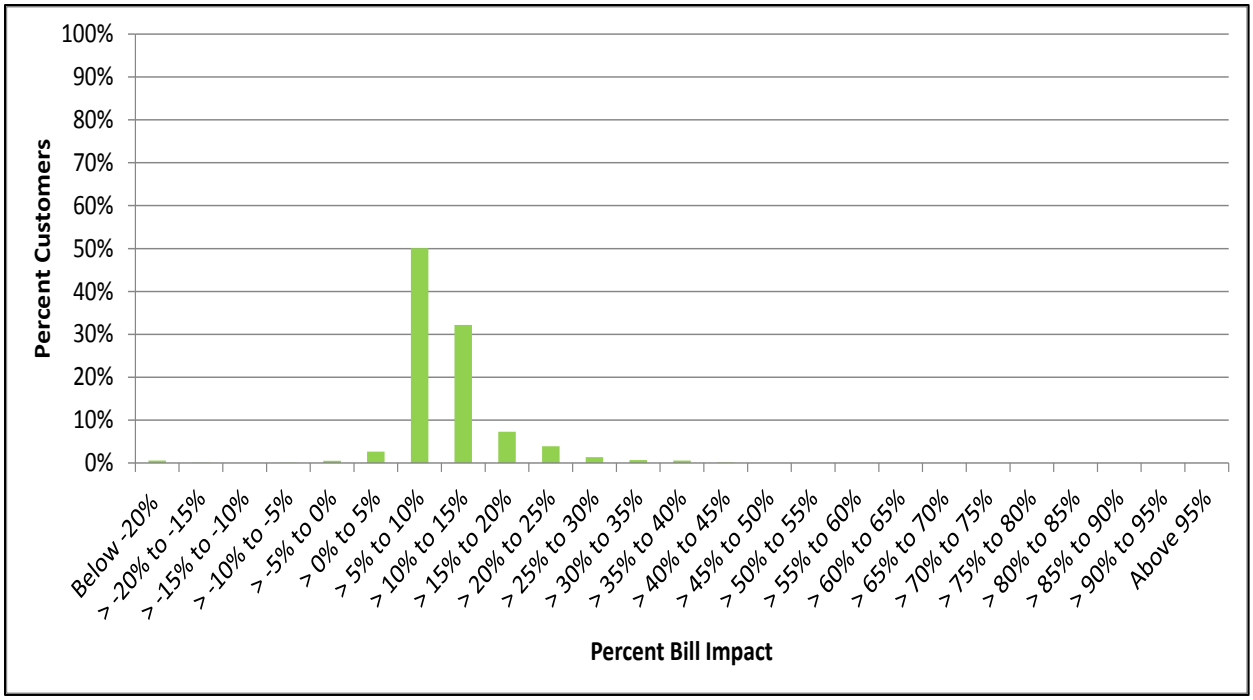
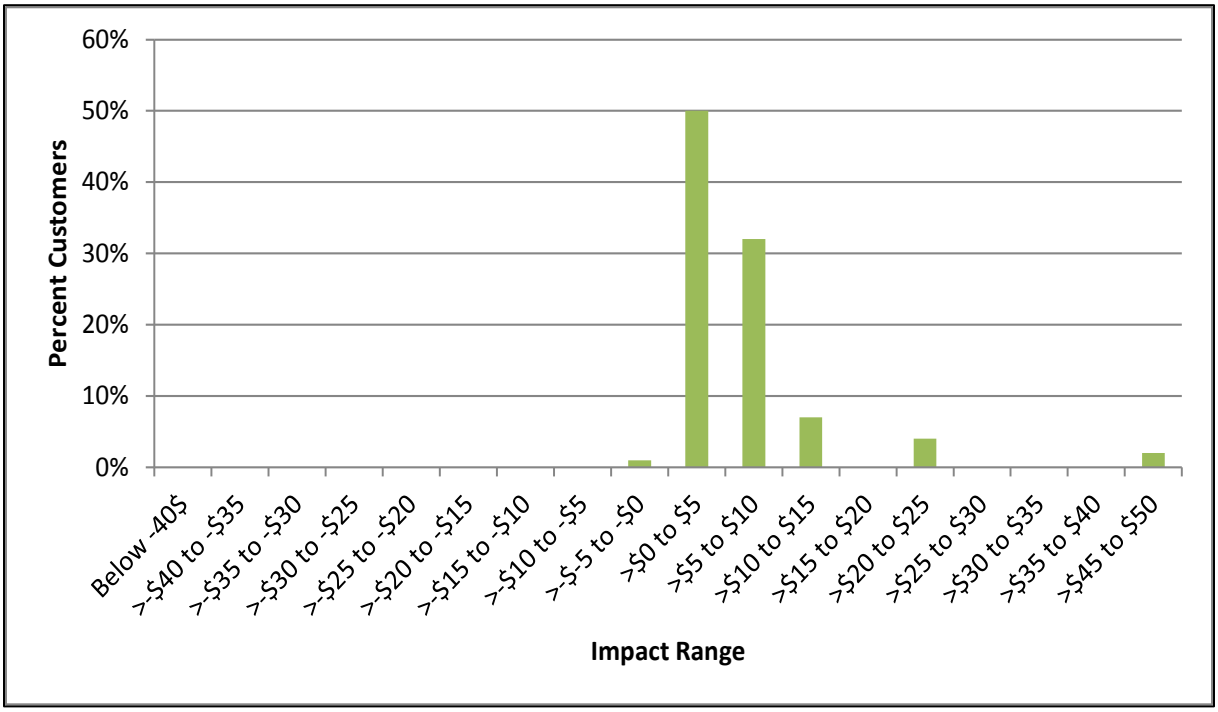



**Figure 7-4** $ Impact - PG&E Transitional Default 3-Tier CARE Customers



## Table 7-7 Rate Design Impacts - PG&E Transitional Default 3-Tier CARE Customers

| Non TOU 3-Tier Rate Design Impacts | | | | | CARE Customers | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Impact | Customer | | Average | | Average Cents/kWh | | % | Monthly $ | | | Average Bill to Income Ratio | |
| Percent Range | Number | Percent | Monthly - kWh | Load Factor | Jul-12 | Proposed | Change | Jul-12 | Proposed | Change | Jul-12 | Proposed |
| Below -20% | 7,473 | 1% | 16 | 9% | 27.75 | 19.44 | -30% | 4.50 | 3.15 | (1.35) | 0.1% | 0.1% |
| > -20% to -15% | 198 | 0% | 43 | 6% | 10.57 | 8.77 | -17% | 4.50 | 3.73 | (0.77) | 0.2% | 0.2% |
| > -15% to -10% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > -10% to -5% | 442 | 0% | 62 | 6% | 10.63 | 9.76 | -8% | 6.54 | 6.01 | (0.53) | 0.5% | 0.5% |
| > -5% to 0% | 6,482 | 1% | 76 | 10% | 9.98 | 9.82 | -2% | 7.57 | 7.45 | (0.12) | 0.3% | 0.3% |
| > 0% to 5% | 33,388 | 3% | 225 | 8% | 8.75 | 9.11 | 4% | 19.22 | 20.01 | 0.80 | 0.8% | 0.8% |
| > 5% to 10% | 634,868 | 50% | 348 | 13% | 8.51 | 9.14 | 7% | 29.66 | 31.85 | 2.19 | 1.3% | 1.4% |
| > 10% to 15% | 408,489 | 32% | 598 | 17% | 9.31 | 10.41 | 12% | 55.62 | 62.24 | 6.62 | 1.6% | 1.8% |
| > 15% to 20% | 92,183 | 7% | 840 | 17% | 9.98 | 11.70 | 17% | 83.83 | 98.19 | 14.37 | 2.0% | 2.4% |
| > 20% to 25% | 49,869 | 4% | 915 | 18% | 10.46 | 12.72 | 22% | 95.72 | 116.36 | 20.65 | 1.9% | 2.3% |
| > 25% to 30% | 17,363 | 1% | 1,517 | 17% | 10.82 | 13.77 | 27% | 164.21 | 208.83 | 44.63 | 4.0% | 5.0% |
| > 30% to 35% | 8,389 | 1% | 1,329 | 21% | 11.08 | 14.52 | 31% | 147.17 | 192.91 | 45.74 | 1.7% | 2.3% |
| > 35% to 40% | 7,593 | 1% | 2,121 | 25% | 11.51 | 15.91 | 38% | 244.19 | 337.41 | 93.22 | 5.1% | 7.1% |
| > 40% to 45% | 1,294 | 0% | 3,579 | 25% | 11.73 | 16.60 | 42% | 419.92 | 594.25 | 174.33 | 5.6% | 7.9% |
| > 45% to 50% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 50% to 55% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 55% to 60% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 60% to 65% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 65% to 70% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 70% to 75% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 75% to 80% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 80% to 85% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 85% to 90% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 90% to 95% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| Above 95% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| Group Total | 1,268,031 | 100% | 516 | 15% | 9.36 | 10.67 | 14% | 48.31 | 55.06 | 6.75 | 1.6% | 1.8% |

## Figure 7-5 PG&E Transitional 3-Tier Non-CARE and CARE Rates

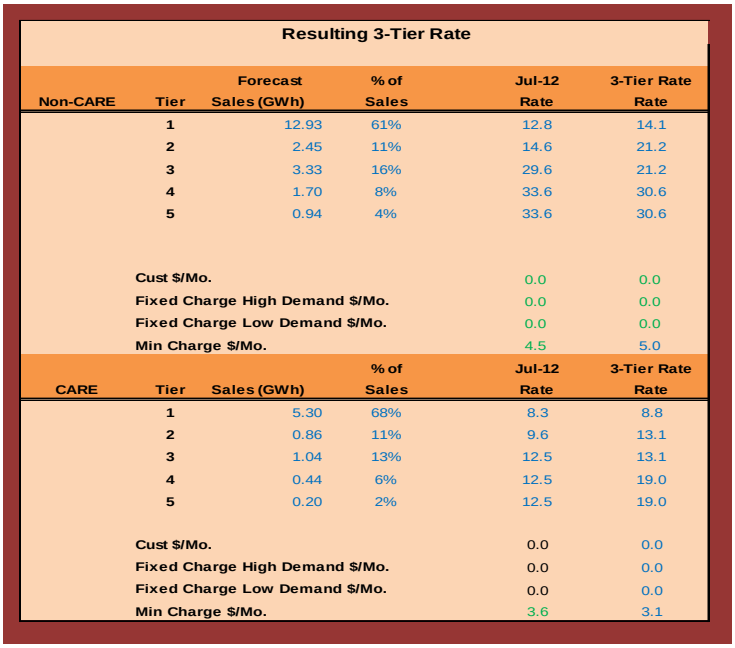


**Figure 7-6** Tier Collapse Criteria - PG&E Transitional Default 3-Tier Rate

| Non TOU Tier Collapsing Criteria | | | |
|---|---|---|---|
| **Number of Tiers** | **2** | **3** | **4** |
| Tier-1 | 1 (Not a user input) | 1 (Not a user input) | 1 (Not a user input) |
| Tier-2 | 2 | 2 | 2 |
| Tier-3 | 2 | 2 | 3 |
| Tier-4 | 2 | 3 | 4 |
| Tier-5 | 2 (Not a user input) | 3 (Not a user input) | 4 (Not a user input) |

**Figure 7-7** Model Inputs - PG&E Transitional Default 3-Tier Rate

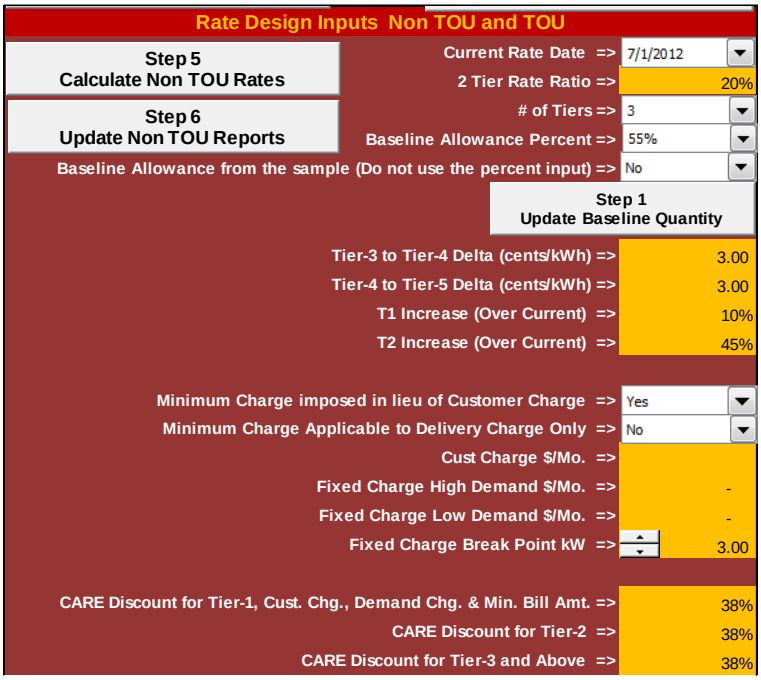



**Figure 7-8** Effective CARE Discount - PG&E Transitional Default 3-Tier Rate

| Rate Design Measures | Current Rate Levels | Non-TOU 3-Tier Rate |
|---|---|---|
| Residential CARE Subsidy ($M) => | $ 627,003,686 | $ 523,000,000 |
| Residential CARE subsidy funded by non-residential class ($M) => | $ 438,902,580 | $ 366,100,000 |
| Effective CARE Discount % => | 49% | 41% |
| Percent of Revenue Requirement met by Fixed Customer Charge => | 0% | 0% |
| Percent Fixed Cost Not Recovered | 21% | 21% |

**PG&E End State Default TOU Non-CARE**

Figure 7-9 indicates that approximately 11% may experience a 0-15% bill increase, 33% may experience a 15-30% bill increase, 48% may experience a 30-45% bill increase, and 7% may experience an increase above 45%. About 7% of customers could experience a $0-$10 bill increase and 93% of customers could experience a $10-$20 bill increase according to Figure 7-10.

**Figure 7-9** % Bill Impact - PG&E End State Default TOU Non-CARE Customers

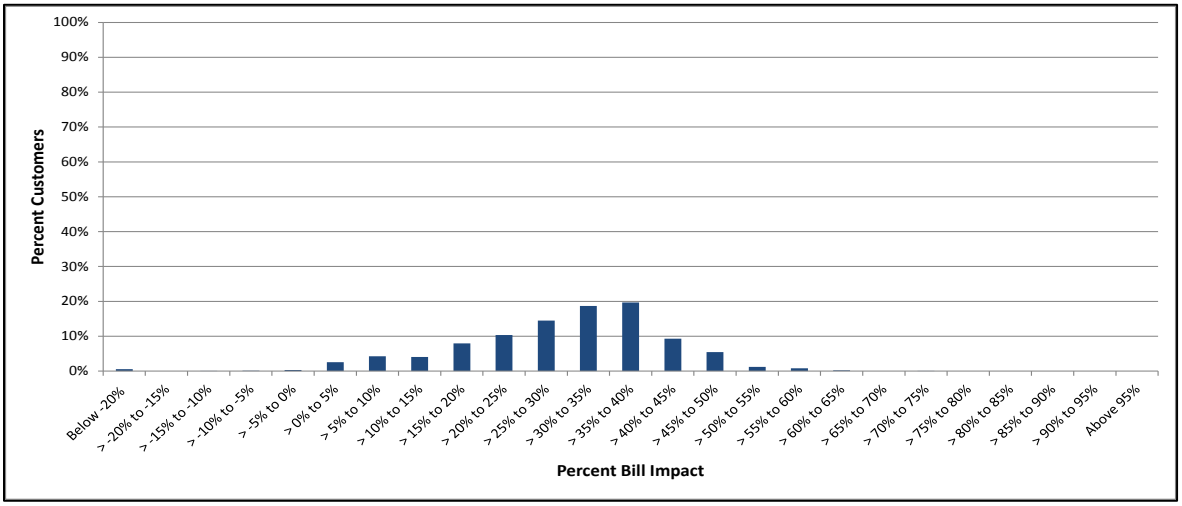
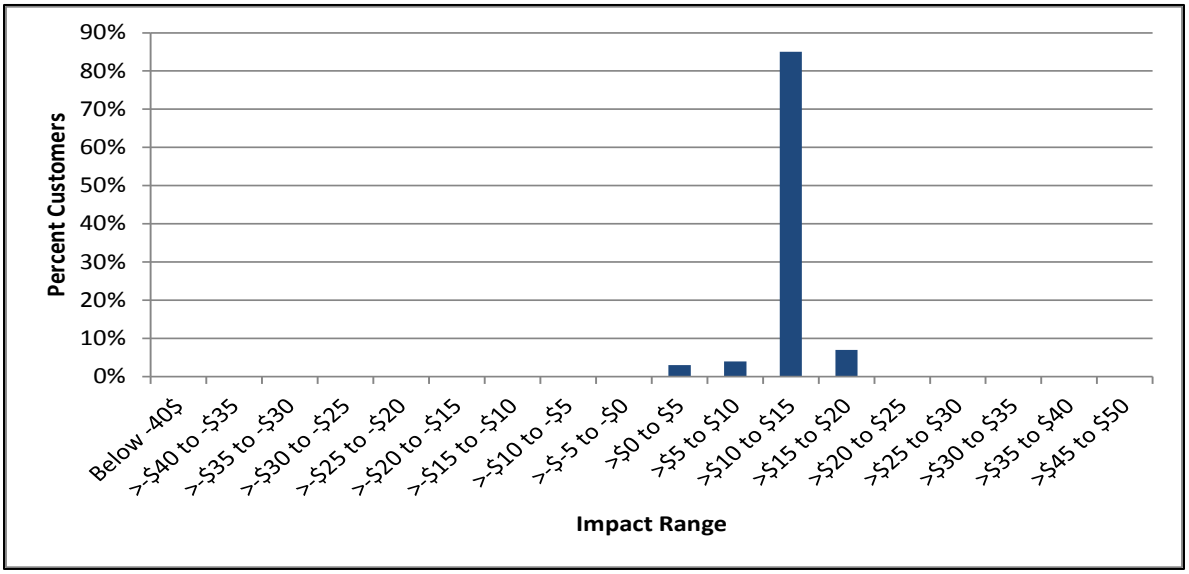



**Figure 7-10** $ Bill Impact - PG&E End State Default TOU Non-CARE Customers



## Table 7-8 Rate Design Impacts - PG&E End State Default TOU Non-CARE Customers

| TOU Rate Design Impacts | NonCARE Customers | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Impact | Customer | | Average | | Average Cents/kWh | | % | Monthly $ | | | Average Bill to Income Ratio | |
| Percent Range | Number | Percent | Monthly - kWh | LF | Jul-12 | Proposed | Change | Jul-12 | Proposed | Change | Jul-12 | Proposed |
| Below -20% | 6,970 | 1% | 15 | 1% | 30.95 | 22.51 | -27% | 279.91 | 3.27 | (1.23) | 0.1% | 0.1% |
| > -20% to -15% | - | 0% | - | 0% | - | - | 0% | 204.92 | - | - | 0.0% | 0.0% |
| > -15% to -10% | 421 | 0% | 5,254 | 3% | 11.72 | 10.25 | -13% | 165.56 | 538.41 | (77.31) | 5.6% | 4.9% |
| > -10% to -5% | 1,685 | 0% | 2,356 | 2% | 11.53 | 10.71 | -7% | 143.55 | 252.28 | (19.27) | 7.0% | 6.5% |
| > -5% to 0% | 4,072 | 0% | 1,203 | 1% | 11.25 | 11.03 | -2% | 119.29 | 132.76 | (2.62) | 3.8% | 3.8% |
| > 0% to 5% | 32,612 | 3% | 1,023 | 1% | 11.01 | 11.40 | 4% | 123.81 | 116.54 | 3.98 | 2.5% | 2.6% |
| > 5% to 10% | 53,983 | 4% | 940 | 1% | 10.59 | 11.45 | 8% | 102.65 | 107.59 | 8.03 | 2.3% | 2.5% |
| > 10% to 15% | 51,137 | 4% | 787 | 2% | 10.14 | 11.47 | 13% | 80.86 | 90.27 | 10.52 | 1.8% | 2.0% |
| > 15% to 20% | 100,605 | 8% | 690 | 1% | 9.70 | 11.36 | 17% | 71.72 | 78.35 | 11.50 | 1.8% | 2.1% |
| > 20% to 25% | 130,999 | 10% | 640 | 1% | 9.44 | 11.57 | 23% | 62.83 | 74.09 | 13.67 | 1.6% | 1.9% |
| > 25% to 30% | 184,028 | 15% | 498 | 1% | 9.14 | 11.61 | 27% | 57.18 | 57.79 | 12.29 | 1.5% | 1.9% |
| > 30% to 35% | 236,728 | 19% | 444 | 1% | 8.85 | 11.76 | 33% | 41.21 | 52.25 | 12.92 | 1.6% | 2.2% |
| > 35% to 40% | 249,535 | 20% | 358 | 1% | 8.62 | 11.84 | 37% | 37.19 | 42.39 | 11.55 | 1.2% | 1.7% |
| > 40% to 45% | 117,675 | 9% | 314 | 1% | 8.49 | 12.04 | 42% | 37.25 | 37.75 | 11.11 | 1.2% | 1.8% |
| > 45% to 50% | 69,248 | 5% | 470 | 1% | 8.64 | 12.78 | 48% | 38.10 | 60.05 | 19.43 | 1.6% | 2.4% |
| > 50% to 55% | 15,379 | 1% | 369 | 1% | 8.46 | 12.85 | 52% | 27.25 | 47.38 | 16.19 | 1.5% | 2.2% |
| > 55% to 60% | 10,131 | 1% | 362 | 1% | 8.45 | 13.25 | 57% | 39.09 | 47.94 | 17.36 | 1.7% | 2.6% |
| > 60% to 65% | 2,577 | 0% | 341 | 1% | 8.43 | 13.70 | 63% | 34.16 | 46.71 | 17.98 | 1.1% | 1.7% |
| > 65% to 70% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 70% to 75% | 245 | 0% | 402 | 1% | 8.32 | 14.19 | 71% | - | 57.03 | 23.62 | 2.5% | 4.3% |
| > 75% to 80% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 80% to 85% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 85% to 90% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 90% to 95% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| Above 95% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| Group Total | 1,268,031 | 100% | 516 | 15% | 9.36 | 11.70 | 25% | 96.71 | 60.38 | 12.06 | 1.6% | 2.0% |

### PG&E End State Default TOU CARE

Figure 7-11 indicates that approximately 20% may experience a bill reduction, 16% may experience a 0-15% increase, 24% may experience a 15-30% increase, 37% may experience a 30-45% increase, and 4% may experience an increase above 45%. About 20% of customers could experience a bill decrease, 10% of customers could experience a $0-$10 bill increase, and 70% of customers could experience a $10-$20 bill increase according to Figure 7-12.

## Figure 7-11 % Bill Impact - PG&E End State Default TOU CARE Customers

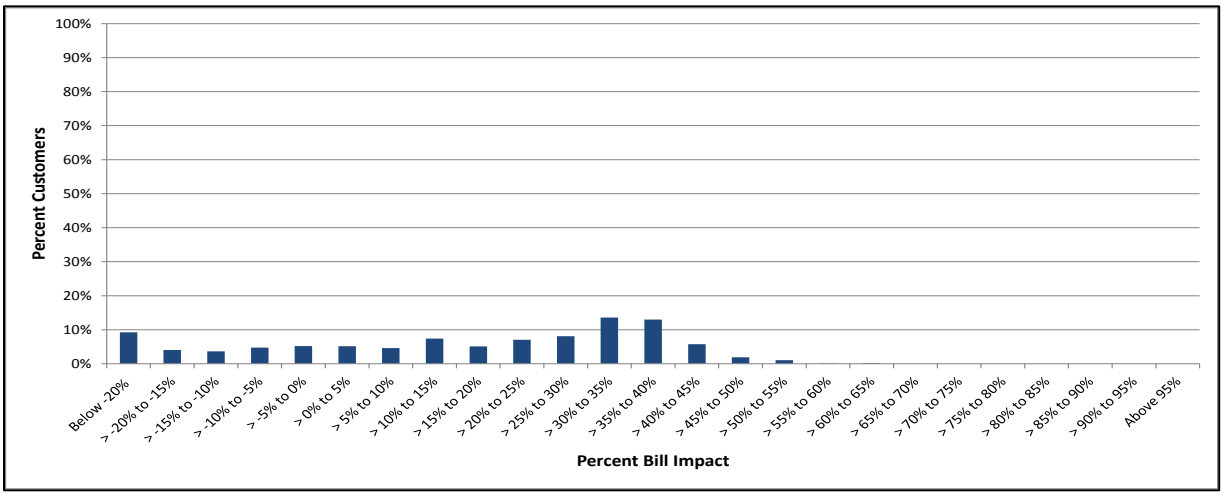


**Figure 7-12** $ Bill Impact - PG&E End State Default TOU CARE Customers

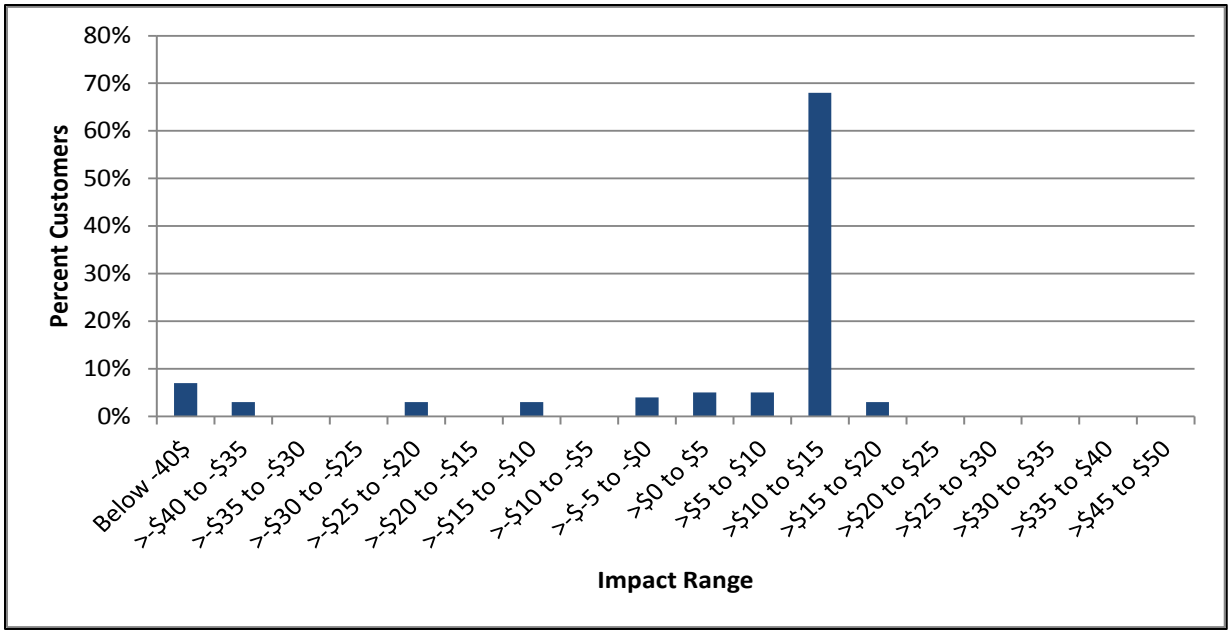
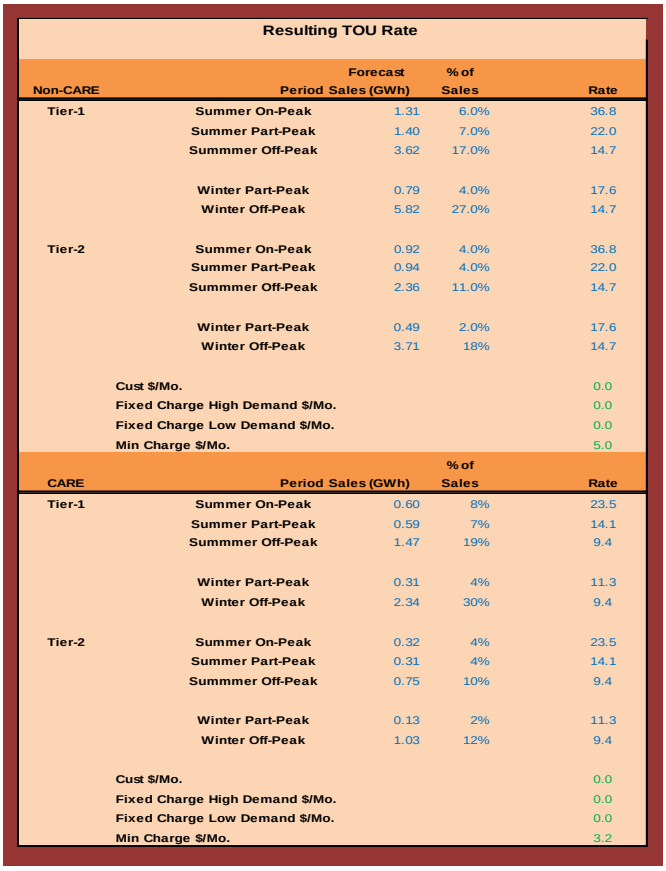



**Table 7-9** Rate Design Impacts - PG&E End State Default TOU CARE Customer.

| TOU Rate Design Impacts | CARE Customers | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Impact | Customer | | Average | | Average Cents/kWh | | % | Monthly $ | | | Average Bill to Income Ratio | |
| Percent Range | Number | Percent | Monthly - kWh | LF | Jul-12 | Proposed | Change | Jul-12 | Proposed | Change | Jul-12 | Proposed |
| Below -20% | 316,965 | 7% | 1,093 | 17% | 25.07 | 17.58 | -30% | 4.50 | 192.03 | (81.83) | 2.7% | 1.9% |
| > -20% to -15% | 135,502 | 3% | 933 | 16% | 21.96 | 18.16 | -17% | - | 169.41 | (35.51) | 2.4% | 2.0% |
| > -15% to -10% | 122,825 | 3% | 817 | 16% | 20.45 | 17.94 | -12% | 615.72 | 146.59 | (20.52) | 2.0% | 1.8% |
| > -10% to -5% | 157,794 | 3% | 753 | 15% | 19.24 | 17.77 | -8% | 271.55 | 133.83 | (11.08) | 1.7% | 1.6% |
| > -5% to 0% | 178,489 | 4% | 665 | 14% | 17.98 | 17.54 | -2% | 135.39 | 116.75 | (2.91) | 1.5% | 1.5% |
| > 0% to 5% | 211,383 | 5% | 742 | 14% | 16.44 | 16.86 | 3% | 112.56 | 125.19 | 3.12 | 1.6% | 1.7% |
| > 5% to 10% | 208,592 | 5% | 688 | 15% | 14.81 | 15.93 | 8% | 99.56 | 109.59 | 7.74 | 1.5% | 1.6% |
| > 10% to 15% | 293,273 | 6% | 553 | 14% | 14.59 | 16.43 | 13% | 79.74 | 90.83 | 10.17 | 1.1% | 1.2% |
| > 15% to 20% | 276,101 | 6% | 551 | 14% | 12.70 | 14.88 | 17% | 66.85 | 81.95 | 12.01 | 1.0% | 1.2% |
| > 20% to 25% | 363,907 | 8% | 504 | 13% | 12.30 | 15.10 | 23% | 60.42 | 76.06 | 14.09 | 1.1% | 1.3% |
| > 25% to 30% | 445,026 | 10% | 445 | 13% | 11.77 | 14.98 | 27% | 45.50 | 66.62 | 14.28 | 1.0% | 1.3% |
| > 30% to 35% | 701,676 | 15% | 354 | 13% | 11.45 | 15.19 | 33% | 39.33 | 53.85 | 13.27 | 0.8% | 1.1% |
| > 35% to 40% | 687,813 | 15% | 310 | 12% | 11.25 | 15.44 | 37% | 30.84 | 47.90 | 13.01 | 0.7% | 1.0% |
| > 40% to 45% | 311,290 | 7% | 296 | 11% | 11.23 | 15.93 | 42% | 26.64 | 47.14 | 13.91 | 0.8% | 1.1% |
| > 45% to 50% | 134,894 | 3% | 383 | 12% | 10.29 | 15.16 | 47% | 40.63 | 58.06 | 18.66 | 0.9% | 1.3% |
| > 50% to 55% | 51,751 | 1% | 257 | 10% | 11.04 | 16.81 | 52% | 31.19 | 43.27 | 14.85 | 0.6% | 1.0% |
| > 55% to 60% | 14,252 | 0% | 344 | 9% | 9.61 | 15.06 | 57% | 30.57 | 51.80 | 18.76 | 1.2% | 1.8% |
| > 60% to 65% | 9,804 | 0% | 285 | 11% | 11.49 | 18.82 | 64% | 28.73 | 53.62 | 20.89 | 1.5% | 2.5% |
| > 65% to 70% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 70% to 75% | 245 | 0% | 402 | 10% | 8.32 | 14.19 | 71% | 33.42 | 57.03 | 23.62 | 2.5% | 4.3% |
| > 75% to 80% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 80% to 85% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 85% to 90% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 90% to 95% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| Above 95% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| Group Total | 4,621,580 | 100% | 527 | 14% | 15.84 | 16.29 | 3% | 48.31 | 85.78 | 2.35 | 1.3% | 1.4% |

**Figure 7-13** Non-CARE and CARE PG&E End State Default TOU Rates

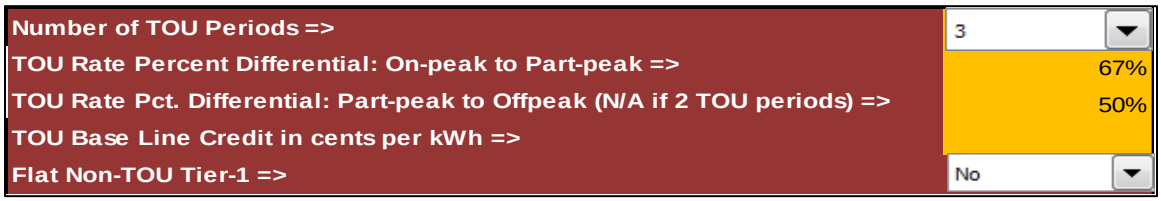


Resulting TOU Rate

| Non-CARE | | Forecast Period Sales (GWh) | % of Sales | Rate |
|---|---|---|---|---|
| Tier-1 | Summer On-Peak | 1.31 | 6.0% | 36.8 |
| | Summer Part-Peak | 1.40 | 7.0% | 22.0 |
| | Summmer Off-Peak | 3.62 | 17.0% | 14.7 |
| | Winter Part-Peak | 0.79 | 4.0% | 17.6 |
| | Winter Off-Peak | 5.82 | 27.0% | 14.7 |
| Tier-2 | Summer On-Peak | 0.92 | 4.0% | 36.8 |
| | Summer Part-Peak | 0.94 | 4.0% | 22.0 |
| | Summmer Off-Peak | 2.36 | 11.0% | 14.7 |
| | Winter Part-Peak | 0.49 | 2.0% | 17.6 |
| | Winter Off-Peak | 3.71 | 18% | 14.7 |
| | Cust $/Mo. | | | 0.0 |
| | Fixed Charge High Demand $/Mo. | | | 0.0 |
| | Fixed Charge Low Demand $/Mo. | | | 0.0 |
| | Min Charge $/Mo. | | | 5.0 |

| CARE | | Period Sales (GWh) | % of Sales | Rate |
|---|---|---|---|---|
| Tier-1 | Summer On-Peak | 0.60 | 8% | 23.5 |
| | Summer Part-Peak | 0.59 | 7% | 14.1 |
| | Summmer Off-Peak | 1.47 | 19% | 9.4 |
| | Winter Part-Peak | 0.31 | 4% | 11.3 |
| | Winter Off-Peak | 2.34 | 30% | 9.4 |
| Tier-2 | Summer On-Peak | 0.32 | 4% | 23.5 |
| | Summer Part-Peak | 0.31 | 4% | 14.1 |
| | Summmer Off-Peak | 0.75 | 10% | 9.4 |
| | Winter Part-Peak | 0.13 | 2% | 11.3 |
| | Winter Off-Peak | 1.03 | 12% | 9.4 |
| | Cust $/Mo. | | | 0.0 |
| | Fixed Charge High Demand $/Mo. | | | 0.0 |
| | Fixed Charge Low Demand $/Mo. | | | 0.0 |
| | Min Charge $/Mo. | | | 3.2 |

**Figure 7-14** Model Inputs – PG&E End State Default TOU Rate



| | |
|---|---|
| Number of TOU Periods => | 3 |
| TOU Rate Percent Differential: On-peak to Part-peak => | 67% |
| TOU Rate Pct. Differential: Part-peak to Offpeak (N/A if 2 TOU periods) => | 50% |
| TOU Base Line Credit in cents per kWh => | |
| Flat Non-TOU Tier-1 => | No |

**Figure 7-15** Effective CARE Discount – PG&E End State Default TOU Rate

| Rate Design Measures | Current Rate Levels | Non-TOU 3-Tier Rate | TOU |
|---|---|---|---|
| Residential CARE Subsidy ($M) => | $ 627,003,686 | $ 620,000,000 | $ 441,000,000 |
| Residential CARE subsidy funded by non-residential class ($M) => | $ 438,902,580 | $ 434,000,000 | $ 308,700,000 |
| Effective CARE Discount % => | 49% | 41% | 35% |
| Percent of Revenue Requirement met by Fixed Customer Charge => | 0% | 0% | 0% |
| Percent Fixed Cost Not Recovered | 21% | 21% | 21% |

**PG&E End State Optional 2-Tier Non-CARE**

Figure 7-16 indicates that approximately 27% may experience a bill reduction, 20% may experience a 0-15% increase, 23% may experience a 15-30% increase, 30% may experience a 30-45% increase. About 27% of customers could experience a bill decrease, 20% of customers could experience a $0-$10 bill increase, and 53% of customers could experience a $10-$20 bill increase according to Figure 7-17.

**Figure 7-16** % Bill Impact - PG&E End State Optional 2-Tier Non-CARE Customers

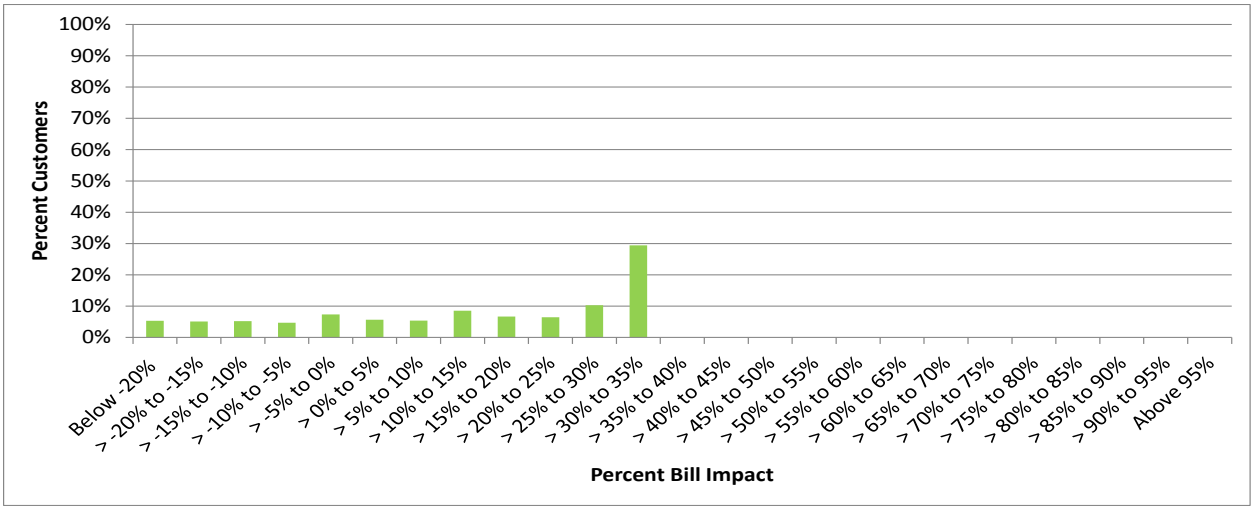
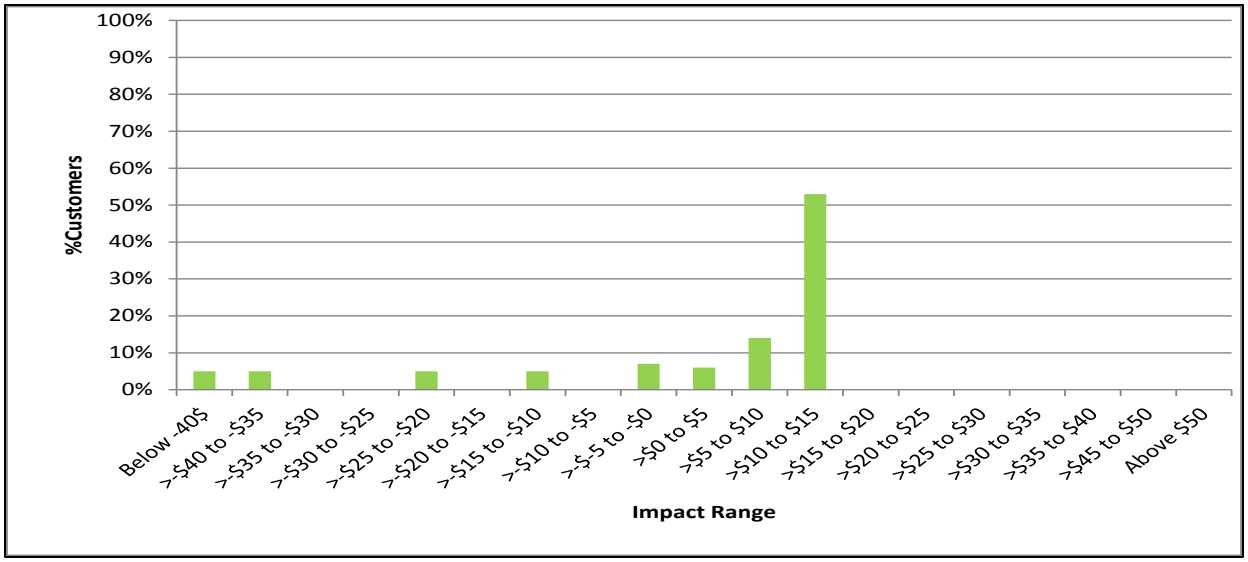



**Figure 7-17** $ Bill Impact - PG&E End State Optional 2-Tier Non-CARE Customers



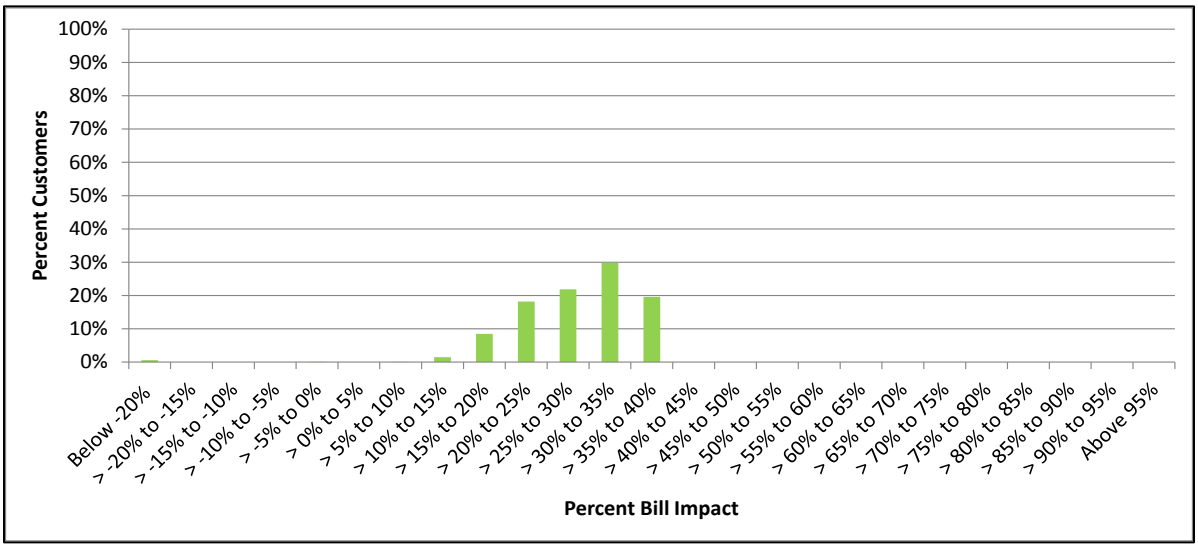
## Table 7-10 Rate Design Impacts - PG&E End State Optional 2-Tier Rate

| Non TOU 2-Tier Rate Design Impacts | | | | | NonCARE Customers | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Impact | Customer | | Average | | Average Cents/kWh | | % | Monthly $ | | | Average Bill to Income Ratio | |
| Percent Range | Number | Percent | Monthly - kWh | Load Factor | Jul-12 | Proposed | Change | Jul-12 | Proposed | Change | Jul-12 | Proposed |
| Below -20% | 177,729 | 5% | 1,351 | 17% | 26.21 | 19.31 | -26% | 354.04 | 260.81 | (93.23) | 3.3% | 2.4% |
| > -20% to -15% | 170,534 | 5% | 917 | 17% | 22.74 | 18.77 | -17% | 208.46 | 172.06 | (36.40) | 2.4% | 2.0% |
| > -15% to -10% | 174,024 | 5% | 857 | 15% | 21.21 | 18.53 | -13% | 181.75 | 158.82 | (22.93) | 2.1% | 1.8% |
| > -10% to -5% | 157,264 | 5% | 788 | 15% | 19.75 | 18.28 | -7% | 155.68 | 144.12 | (11.56) | 2.0% | 1.8% |
| > -5% to 0% | 246,187 | 7% | 693 | 14% | 18.54 | 18.07 | -3% | 128.56 | 125.33 | (3.24) | 1.6% | 1.6% |
| > 0% to 5% | 189,804 | 6% | 621 | 14% | 17.49 | 17.89 | 2% | 108.68 | 111.11 | 2.43 | 1.3% | 1.3% |
| > 5% to 10% | 179,847 | 5% | 584 | 14% | 16.51 | 17.69 | 7% | 96.47 | 103.38 | 6.90 | 1.2% | 1.3% |
| > 10% to 15% | 286,375 | 9% | 506 | 13% | 15.60 | 17.56 | 13% | 78.94 | 88.85 | 9.90 | 0.9% | 1.0% |
| > 15% to 20% | 223,361 | 7% | 474 | 13% | 14.85 | 17.40 | 17% | 70.36 | 82.45 | 12.09 | 0.9% | 1.1% |
| > 20% to 25% | 216,584 | 6% | 433 | 12% | 14.09 | 17.24 | 22% | 61.03 | 74.67 | 13.64 | 0.9% | 1.1% |
| > 25% to 30% | 345,479 | 10% | 358 | 11% | 13.42 | 17.15 | 28% | 47.99 | 61.34 | 13.35 | 0.7% | 0.9% |
| > 30% to 35% | 986,361 | 29% | 251 | 12% | 12.92 | 17.03 | 32% | 32.42 | 42.76 | 10.34 | 0.6% | 0.7% |
| > 35% to 40% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 40% to 45% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 45% to 50% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 50% to 55% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 55% to 60% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 60% to 65% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 65% to 70% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 70% to 75% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 75% to 80% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 80% to 85% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 85% to 90% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 90% to 95% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| Above 95% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| Group Total | 3,353,549 | 100% | 530 | 13% | 18.23 | 17.99 | -1% | 96.71 | 95.40 | (1.31) | 1.3% | 1.3% |

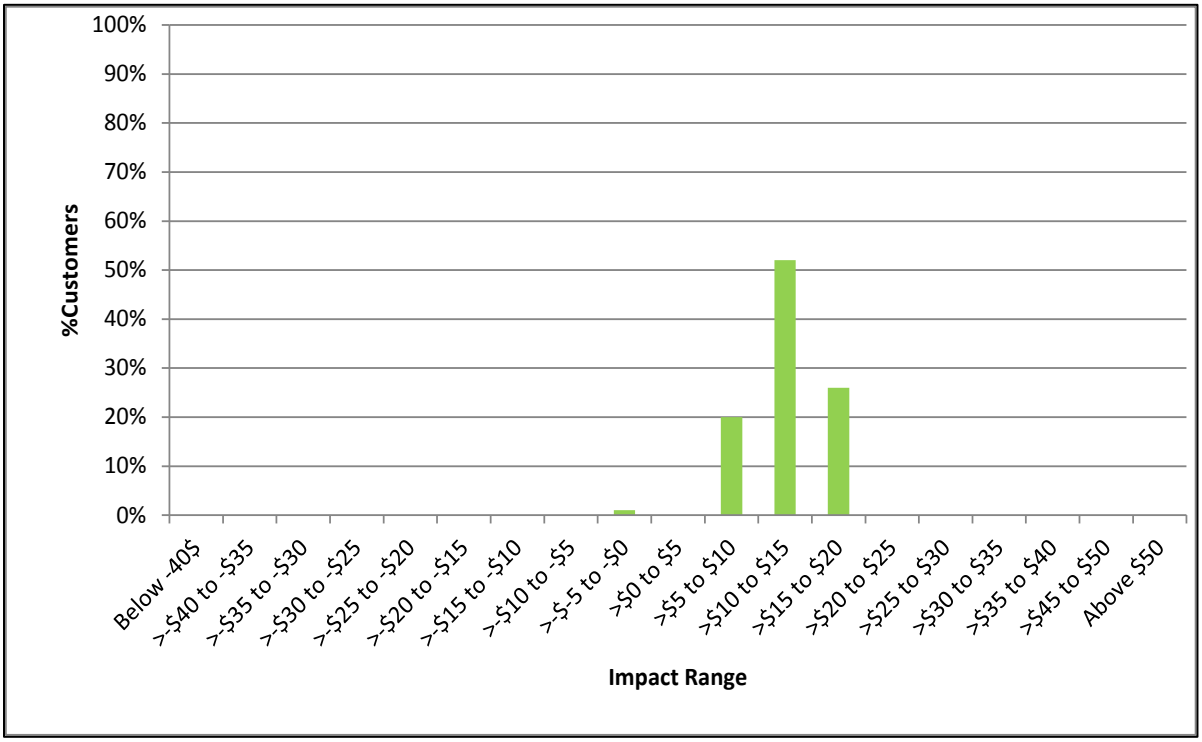
**PG&E End State Optional 2-Tier CARE**

Figure 7-18 indicates that approximately 1% may experience a bill reduction, 3% may experience a 0-15% increase, 48% may experience a 15-30%, and 49% may experience a 30-45% increase. About 1% of customers could experience a bill decrease, 20% of customers could experience a bill increase from $0-$10, 78% of customers could experience a bill increase from $10-$20, and 2% of customers could experience a bill increase above $20.

## Figure 7-18 % Bill Impact - PG&E CARE End State Optional 2-Tier Customers



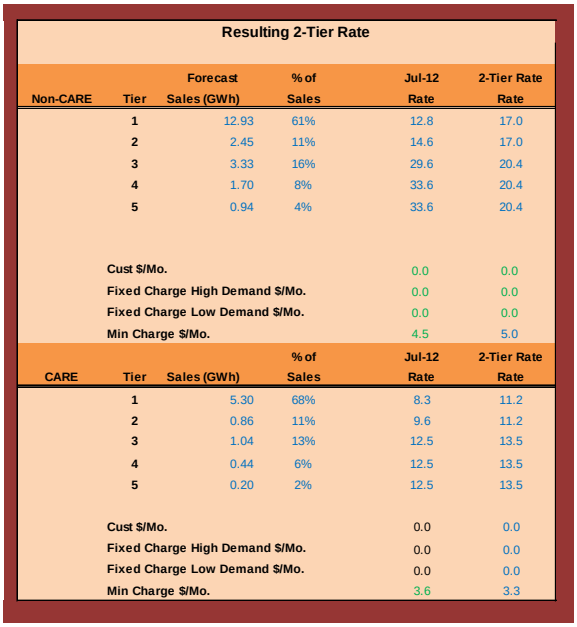
## Table 7-11 $ Bill Impact - PG&E End State Optional 2-Tier CARE Customers




## Table 7-12 Rate Design Impacts - PG&E End State Optional 2-Tier CARE Customers

| Non TOU 2-Tier Rate Design Impacts | | | | | CARE Customers | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Impact | Customer | | Average | | Average Cents/kWh | | % | Monthly $ | | | Average Bill to Income Ratio | |
| Percent Range | Number | Percent | Monthly - kWh | Load Factor | Jul-12 | Proposed | Change | Jul-12 | Proposed | Change | Jul-12 | Proposed |
| Below -20% | 6,970 | 1% | 15 | 8% | 30.95 | 23.69 | -23% | 4.50 | 3.44 | (1.06) | 0.1% | 0.1% |
| > -20% to -15% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > -15% to -10% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > -10% to -5% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > -5% to 0% | 503 | 0% | 39 | 22% | 11.41 | 11.25 | -1% | 4.50 | 4.43 | (0.07) | 1.0% | 1.0% |
| > 0% to 5% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 5% to 10% | 198 | 0% | 43 | 6% | 10.57 | 11.23 | 6% | 4.50 | 4.78 | 0.28 | 0.2% | 0.2% |
| > 10% to 15% | 18,925 | 1% | 1,772 | 22% | 11.37 | 12.84 | 13% | 201.48 | 227.43 | 25.95 | 3.0% | 3.4% |
| > 15% to 20% | 107,512 | 8% | 908 | 17% | 10.51 | 12.34 | 17% | 95.42 | 112.03 | 16.61 | 2.3% | 2.7% |
| > 20% to 25% | 230,569 | 18% | 744 | 17% | 9.68 | 11.87 | 23% | 72.01 | 88.25 | 16.24 | 1.8% | 2.2% |
| > 25% to 30% | 276,892 | 22% | 522 | 15% | 9.03 | 11.51 | 28% | 47.13 | 60.11 | 12.98 | 1.5% | 1.9% |
| > 30% to 35% | 377,809 | 30% | 394 | 14% | 8.50 | 11.28 | 33% | 33.49 | 44.45 | 10.96 | 1.3% | 1.7% |
| > 35% to 40% | 248,652 | 20% | 235 | 13% | 8.32 | 11.23 | 35% | 19.52 | 26.36 | 6.84 | 1.1% | 1.5% |
| > 40% to 45% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 45% to 50% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 50% to 55% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 55% to 60% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 60% to 65% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 65% to 70% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 70% to 75% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 75% to 80% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 80% to 85% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 85% to 90% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| > 90% to 95% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| Above 95% | - | 0% | - | 0% | - | - | 0% | - | - | - | 0.0% | 0.0% |
| Group Total | 1,268,031 | 100% | 516 | 15% | 9.36 | 11.72 | 25% | 48.31 | 60.50 | 12.19 | 1.6% | 2.0% |

**Figure 7-19** PG&E End State Optional 2-Tier Non-CARE and CARE Rates

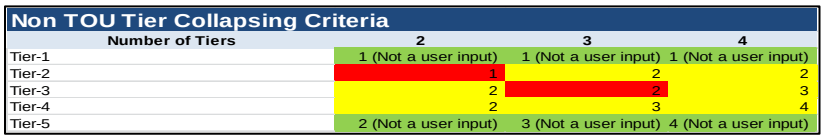


Resulting 2-Tier Rate

| Non-CARE | Tier | Forecast Sales (GWh) | % of Sales | Jul-12 Rate | 2-Tier Rate Rate |
|---|---|---|---|---|---|
| | 1 | 12.93 | 61% | 12.8 | 17.0 |
| | 2 | 2.45 | 11% | 14.6 | 17.0 |
| | 3 | 3.33 | 16% | 29.6 | 20.4 |
| | 4 | 1.70 | 8% | 33.6 | 20.4 |
| | 5 | 0.94 | 4% | 33.6 | 20.4 |
| | Cust $/Mo. | | | 0.0 | 0.0 |
| | Fixed Charge High Demand $/Mo. | | | 0.0 | 0.0 |
| | Fixed Charge Low Demand $/Mo. | | | 0.0 | 0.0 |
| | Min Charge $/Mo. | | | 4.5 | 5.0 |

| CARE | Tier | Sales (GWh) | % of Sales | Jul-12 Rate | 2-Tier Rate Rate |
|---|---|---|---|---|---|
| | 1 | 5.30 | 68% | 8.3 | 11.2 |
| | 2 | 0.86 | 11% | 9.6 | 11.2 |
| | 3 | 1.04 | 13% | 12.5 | 13.5 |
| | 4 | 0.44 | 6% | 12.5 | 13.5 |
| | 5 | 0.20 | 2% | 12.5 | 13.5 |
| | Cust $/Mo. | | | 0.0 | 0.0 |
| | Fixed Charge High Demand $/Mo. | | | 0.0 | 0.0 |
| | Fixed Charge Low Demand $/Mo. | | | 0.0 | 0.0 |
| | Min Charge $/Mo. | | | 3.6 | 3.3 |

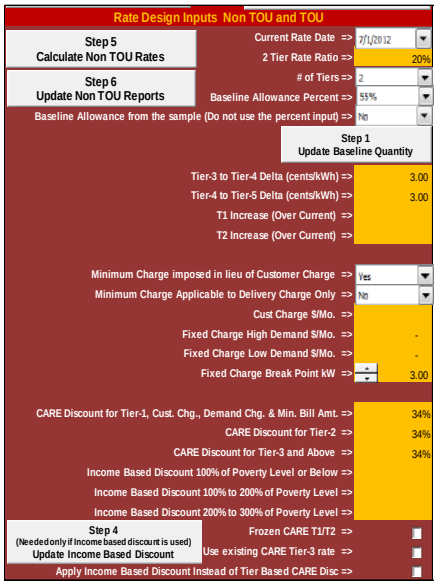
**Figure 7-20** Tier Collapsing Criteria - PG&E End State Optional 2-Tier Rate



Non TOU Tier Collapsing Criteria

| Number of Tiers | 2 | 3 | 4 |
|---|---|---|---|
| Tier-1 | 1 (Not a user input) | 1 (Not a user input) | 1 (Not a user input) |
| Tier-2 | 1 | 2 | 2 |
| Tier-3 | 2 | 2 | 3 |
| Tier-4 | 2 | 3 | 4 |
| Tier-5 | 2 (Not a user input) | 3 (Not a user input) | 4 (Not a user input) |

**Figure 7-21** Model Inputs - PG&E End State Optional 2-Tier Rate



Rate Design Inputs Non TOU and TOU

Step 5 Calculate Non TOU Rates

Step 6 Update Non TOU Reports

Current Rate Date => 7/1/2012

2 Tier Rate Ratio => 20%

# of Tiers => 2

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) =>

T1 Increase (Over Current) =>

T2 Increase (Over Current) =>

Minimum Charge imposed in lieu of Customer Charge => Yes

Minimum Charge Applicable to Delivery Charge Only => No

Cust Charge $/Mo. =>

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. => 34%

CARE Discount for Tier-2 => 34%

CARE Discount for Tier-3 and Above => 34%

Income Based Discount 100% of Poverty Level or Below =>

Income Based Discount 100% to 200% of Poverty Level =>

Income Based Discount 200% to 300% of Poverty Level =>

Step 4 (Needed only if income based discount is used) Update Income Based Discount

Frozen CARE T1/T2 =>

Use existing CARE Tier-3 rate =>

Apply Income Based Discount Instead of Tier Based CARE Disc =>

**SCE Transitional Default 3-Tier Non-CARE**

Figure 7-13 indicates that approximately 23% may experience a bill reduction and 76% may experience a 0-20% bill increase. About 23% of customers could experience a bill decrease, 75% of customers could experience a $0-$10 bill increase, and 2% of customers could experience a bill increase from $10-$15.

**Table 7-13** % Bill Impact - SCE Transitional Default 3-Tier Non-CARE Customers

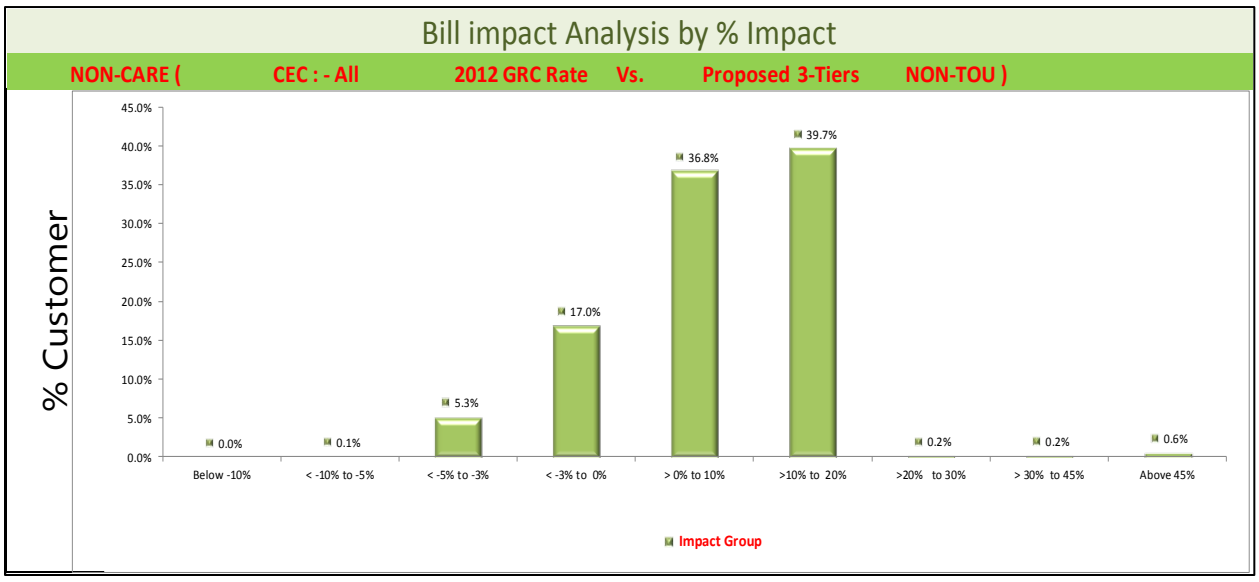
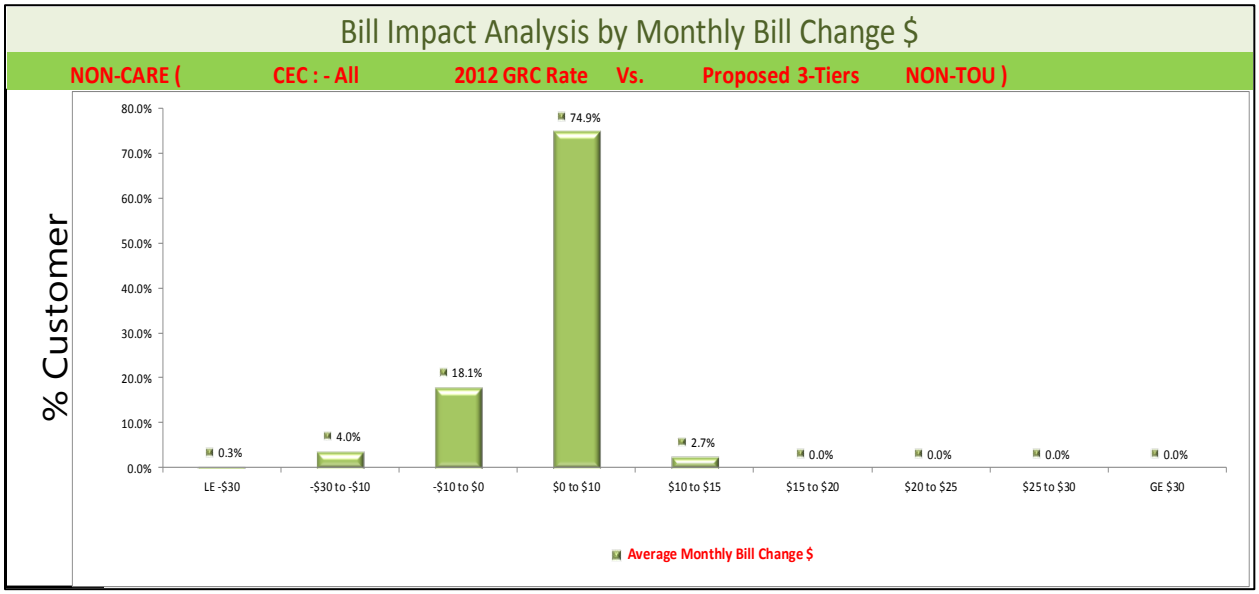



**Table 7-14** $ Impact - SCE Transitional Default 3-Tier Non-CARE Customers



## Table 7-15 % Bill Impacts - SCE Transitional Default 3-Tier Non-CARE Customers

| Impact Group | Customer | | | | Average | | | Elasticity | Cents/kWh | | % | Monthly $ | | Average | Average | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % | Number | % Customer | % Single | %Multi | Monthly - kWh | Annual Load Factor | % On Peak | Average Monthly Δ kWh | 2012 GRC Rate | Proposed | Change | 2012 GRC Rate | Proposed | Monthly $ Change | Current Annual Bill as a % of Income | Proposed Annual Bill as a % of Income |
| Below -10% | 0 | 0.0% | 0.0% | 0.0% | 0 | 0.0% | 0.0% | 0 | 0.0 | 0.0 | 0.0% | $0.00 | $0.00 | $0.00 | 0.0% | 0.0% |
| < -10% to -5% | 3,938 | 0.1% | 0.2% | 0.0% | 7,483 | 24.2% | 6.7% | 63 | 29.9 | 28.3 | -5.4% | $2,238.05 | $2,116.10 | -$121.95 | 20.0% | 18.9% |
| < -5% to -3% | 151,076 | 5.3% | 6.7% | 0.5% | 1,562 | 20.1% | 7.3% | 12 | 25.5 | 24.5 | -3.7% | $398.18 | $383.52 | -$14.65 | 3.2% | 3.1% |
| < -3% to 0% | 486,689 | 17.0% | 21.1% | 2.8% | 932 | 18.0% | 7.5% | 3 | 22.0 | 21.6 | -1.7% | $205.13 | $201.71 | -$3.41 | 2.0% | 1.9% |
| > 0% to 10% | 1,055,454 | 36.8% | 38.3% | 31.8% | 561 | 13.4% | 7.0% | (5) | 17.9 | 18.6 | 4.0% | $100.32 | $104.35 | $4.04 | 1.2% | 1.3% |
| >10% to 20% | 1,139,204 | 39.7% | 33.2% | 62.2% | 329 | 11.2% | 5.9% | (9) | 14.1 | 16.0 | 13.1% | $46.48 | $52.55 | $6.07 | 0.7% | 0.8% |
| >20% to 30% | 5,377 | 0.2% | 0.0% | 0.8% | 104 | 4.4% | 4.0% | (6) | 13.9 | 17.2 | 23.9% | $14.49 | $17.95 | $3.46 | 0.2% | 0.3% |
| > 30% to 45% | 6,982 | 0.2% | 0.1% | 0.6% | 54 | 4.1% | 3.2% | (5) | 14.8 | 19.5 | 31.9% | $8.04 | $10.60 | $2.56 | 0.1% | 0.1% |
| Above 45% | 17,349 | 0.6% | 0.4% | 1.3% | 7 | 4.0% | 5.2% | (2) | 26.6 | 81.3 | 206.1% | $1.81 | $5.54 | $3.73 | 0.0% | 0.1% |
| Group Total | 2,866,068 | 100.0% | 100.0% | 100.0% | 589 | 13.6% | 6.9% | (3.9) | 19.4 | 19.8 | 2.1% | $114.38 | $116.81 | $2.43 | 1.4% | 1.4% |

## Table 7-16 $ Impacts - SCE Transitional Default 3-Tier Non-CARE Customers

| Average Monthly Bill Change $ | Customer | | | | Average | | | Elasticity | Cents/kWh | | % | Monthly $ | | Average | Average | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % | Number | % Customer | % Single | %Multi | Monthly - kWh | Annual Load Factor | % On Peak | Average Monthly Δ kWh | 2012 GRC Rate | Proposed | Change | 2012 GRC Rate | Proposed | Monthly $ Change | Current Annual Bill as a % of Income | Proposed Annual Bill as a % of Income |
| LE -$30 | 7,629 | 0.3% | 0.3% | 0.0% | 5,478 | 21.4% | 6.9% | 47 | 29.1 | 27.6 | -5.2% | $1,594.33 | $1,512.10 | -$82.22 | 15.0% | 14.3% |
| -$30 to -$10 | 115,301 | 4.0% | 5.1% | 0.5% | 1,621 | 20.9% | 7.4% | 12 | 25.5 | 24.6 | -3.7% | $413.66 | $398.40 | -$15.26 | 3.4% | 3.3% |
| -$10 to $0 | 518,773 | 18.1% | 22.6% | 2.8% | 939 | 17.9% | 7.5% | 4 | 22.2 | 21.8 | -1.8% | $208.04 | $204.36 | -$3.68 | 2.0% | 1.9% |
| $0 to $10 | 2,147,720 | 74.9% | 69.7% | 92.7% | 433 | 12.0% | 6.6% | (6) | 16.5 | 17.6 | 6.8% | $71.43 | $76.29 | $4.86 | 0.9% | 1.0% |
| $10 to $15 | 76,428 | 2.7% | 2.3% | 4.0% | 577 | 13.8% | 6.5% | (15) | 14.9 | 16.8 | 12.8% | $85.90 | $96.87 | $10.97 | 1.1% | 1.3% |
| $15 to $20 | 217 | 0.0% | 0.0% | 0.0% | 778 | 12.4% | 13.5% | (21) | 15.2 | 17.3 | 13.6% | $118.39 | $134.48 | $16.08 | 4.7% | 5.4% |
| $20 to $25 | 0 | 0.0% | 0.0% | 0.0% | 0 | 0.0% | 0.0% | 0 | 0.0 | 0.0 | 0.0% | $0.00 | $0.00 | $0.00 | 0.0% | 0.0% |
| $25 to $30 | 0 | 0.0% | 0.0% | 0.0% | 0 | 0.0% | 0.0% | 0 | 0.0 | 0.0 | 0.0% | $0.00 | $0.00 | $0.00 | 0.0% | 0.0% |
| GE $30 | 0 | 0.0% | 0.0% | 0.0% | 0 | 0.0% | 0.0% | 0 | 0.0 | 0.0 | 0.0% | $0.00 | $0.00 | $0.00 | 0.0% | 0.0% |
| Group Total | 2,866,068 | 100.0% | 100.0% | 100.0% | 589 | 13.6% | 6.9% | (3.9) | 19.4 | 19.8 | 2.1% | $114.38 | $116.81 | $2.43 | 1.4% | 1.4% |

### SCE Transitional Default 3-Tier CARE

Figure 7-22 indicates that approximately 71% may experience a bill reduction and 29% may experience a 0-10% bill increase. About 70% of customers could experience a bill decrease and 30% of customers could experience a $0-$10 bill increase.

**Figure 7-22** % Bill Impact - SCE Transitional Default 3-Tier CARE Customers

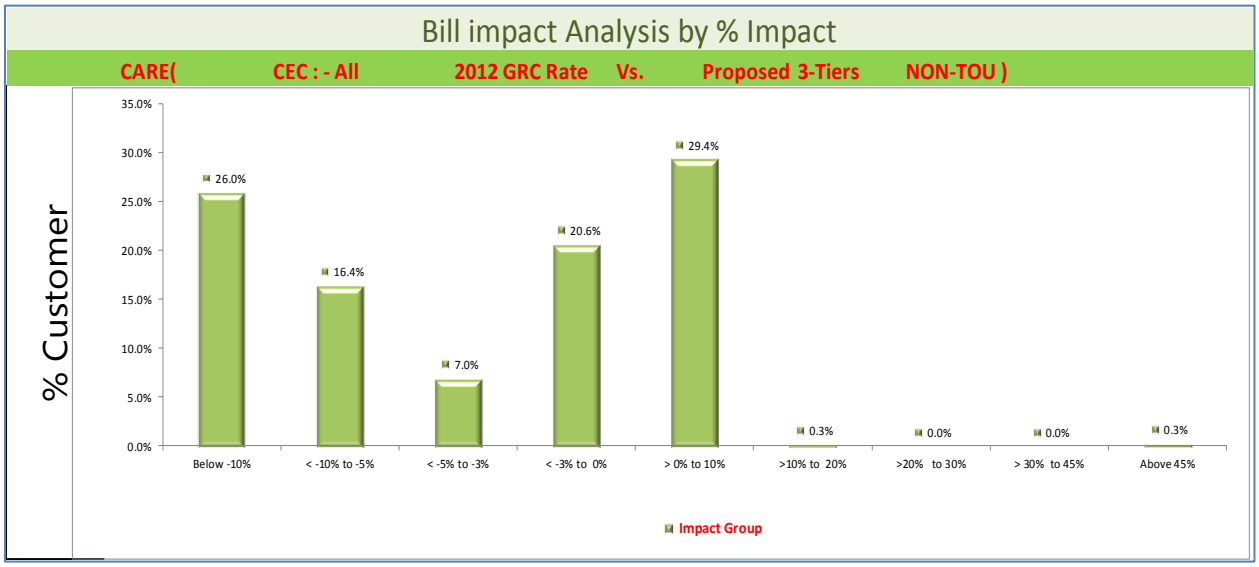
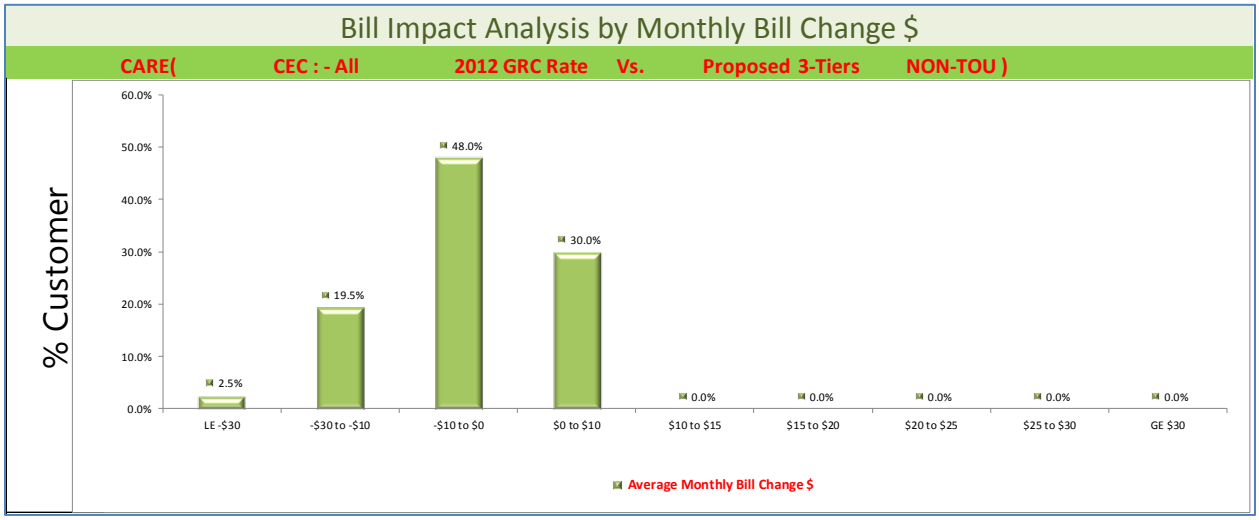



**Figure 7-23** $ Bill Impact - SCE Transitional Default 3-Tier CARE Customers



## Table 7-17 % Bill Impacts - SCE Transitional 3-Tier CARE Customers

| Impact Group | Customer | | | | Average | | | Elasticity | Cents/kWh | | % | Monthly $ | | Average | Average | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % | Number | % Customer | % Single | %Multi | Monthly - kWh | Annual Load Factor | % On Peak | Average Monthly Δ kWh | 2012 GRC Rate | Proposed | Change | 2012 GRC Rate | Proposed | Monthly $ Change | Current Annual Bill as a % of Income | Proposed Annual Bill as a % of Income |
| Below -10% | 358,542 | 26.0% | 35.5% | 7.6% | 918 | 19.7% | 8.3% | 25 | 14.9 | 12.9 | -13.1% | $136.77 | $118.92 | -$17.86 | 2.1% | 1.9% |
| < -10% to -5% | 226,834 | 16.4% | 18.8% | 11.8% | 546 | 15.8% | 8.2% | 10 | 11.8 | 10.9 | -7.8% | $64.26 | $59.28 | -$4.98 | 1.2% | 1.1% |
| < -5% to -3% | 96,456 | 7.0% | 5.7% | 9.5% | 359 | 13.4% | 7.7% | 3 | 10.5 | 10.1 | -4.0% | $37.68 | $36.16 | -$1.52 | 0.7% | 0.7% |
| < -3% to 0% | 284,850 | 20.6% | 15.6% | 30.3% | 296 | 13.3% | 7.5% | 1 | 9.7 | 9.5 | -1.4% | $28.62 | $28.22 | -$0.40 | 0.6% | 0.6% |
| > 0% to 10% | 405,996 | 29.4% | 23.7% | 40.3% | 330 | 13.6% | 7.4% | (1) | 9.1 | 9.3 | 2.0% | $30.15 | $30.76 | $0.61 | 0.6% | 0.6% |
| >10% to 20% | 3,469 | 0.3% | 0.3% | 0.1% | 172 | 6.0% | 0.2% | (4) | 9.3 | 10.3 | 11.6% | $15.91 | $17.76 | $1.84 | 0.4% | 0.4% |
| >20% to 30% | 0 | 0.0% | 0.0% | 0.0% | 0 | 0.0% | 0.0% | 0 | 0.0 | 0.0 | 0.0% | $0.00 | $0.00 | $0.00 | 0.0% | 0.0% |
| > 30% to 45% | 133 | 0.0% | 0.0% | 0.0% | 37 | 2.2% | 0.0% | (3) | 11.1 | 15.4 | 38.2% | $4.08 | $5.63 | $1.56 | 0.1% | 0.2% |
| Above 45% | 4,775 | 0.3% | 0.3% | 0.3% | 19 | 2.2% | 4.1% | (2) | 12.5 | 20.4 | 63.2% | $2.39 | $3.91 | $1.51 | 0.0% | 0.1% |
| Group Total | 1,381,056 | 100.0% | 100.0% | 100.0% | 509 | 15.3% | 8.0% | 7.5 | 12.4 | 11.3 | -8.5% | $62.97 | $57.61 | -$5.36 | 1.2% | 1.1% |

## Table 7-18 $ Bill Impacts Experienced by SCE Transitional 3-Tier CARE Customers

| Average Monthly Bill Change $ | Customer | | | | Average | | | Elasticity | Cents/kWh | | % | Monthly $ | | Average | Average | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % | Number | % Customer | % Single | %Multi | Monthly - kWh | Annual Load Factor | % On Peak | Average Monthly Δ kWh | 2012 GRC Rate | Proposed | Change | 2012 GRC Rate | Proposed | Monthly $ Change | Current Annual Bill as a % of Income | Proposed Annual Bill as a % of Income |
| LE -$30 | 35,208 | 2.5% | 3.5% | 0.7% | 1,583 | 24.2% | 6.6% | 42 | 16.8 | 14.6 | -13.4% | $266.65 | $230.89 | -$35.77 | 4.5% | 3.9% |
| -$30 to -$10 | 268,813 | 19.5% | 26.9% | 5.2% | 928 | 19.4% | 8.9% | 24 | 14.6 | 12.7 | -13.0% | $135.93 | $118.25 | -$17.67 | 2.3% | 2.0% |
| -$10 to $0 | 662,661 | 48.0% | 45.2% | 53.3% | 403 | 14.3% | 7.7% | 5 | 11.0 | 10.4 | -6.0% | $44.48 | $41.80 | -$2.68 | 0.8% | 0.8% |
| $0 to $10 | 414,374 | 30.0% | 24.4% | 40.8% | 326 | 13.4% | 7.4% | (1) | 9.1 | 9.3 | 2.1% | $29.77 | $30.40 | $0.63 | 0.6% | 0.6% |
| $10 to $15 | 0 | 0.0% | 0.0% | 0.0% | 0 | 0.0% | 0.0% | 0 | 0.0 | 0.0 | 0.0% | $0.00 | $0.00 | $0.00 | 0.0% | 0.0% |
| $15 to $20 | 0 | 0.0% | 0.0% | 0.0% | 0 | 0.0% | 0.0% | 0 | 0.0 | 0.0 | 0.0% | $0.00 | $0.00 | $0.00 | 0.0% | 0.0% |
| $20 to $25 | 0 | 0.0% | 0.0% | 0.0% | 0 | 0.0% | 0.0% | 0 | 0.0 | 0.0 | 0.0% | $0.00 | $0.00 | $0.00 | 0.0% | 0.0% |
| $25 to $30 | 0 | 0.0% | 0.0% | 0.0% | 0 | 0.0% | 0.0% | 0 | 0.0 | 0.0 | 0.0% | $0.00 | $0.00 | $0.00 | 0.0% | 0.0% |
| GE $30 | 0 | 0.0% | 0.0% | 0.0% | 0 | 0.0% | 0.0% | 0 | 0.0 | 0.0 | 0.0% | $0.00 | $0.00 | $0.00 | 0.0% | 0.0% |
| Group Total | 1,381,056 | 100.0% | 100.0% | 100.0% | 509 | 15.3% | 8.0% | 7.5 | 12.4 | 11.3 | -8.5% | $62.97 | $57.61 | -$5.36 | 1.2% | 1.1% |

## Figure 7-24 SCE Transitional Default 3-Tier Non-CARE and CARE Rates

**Estimated Residential Rate Calculated based on Inputs**

| Non-CARE | Tier | Forecast Sales (GWh) | % of Sales | Pre-Crisis 2001 Rate | 2012 GRC Rate | 3-Tiers Rate |
|---|---|---|---|---|---|---|
| | 1 | 9,617 | 50% | 12.0 | 13.0 | 14.1 |
| | 2 | 5,422 | 28% | 14.2 | 16.0 | 23.2 |
| | 3 | - | 0% | 14.2 | 27.1 | 29.9 |
| | 4 | 2,353 | 12% | 14.2 | 31.1 | 29.9 |
| | 5 | 1,888 | 10% | 14.2 | 31.1 | 29.9 |
| Flat customer Charge $ / Month | | | | 1.00 | 0.88 | 0.00 |
| | | | | | | 0.00 |
| Min Charge $/Mo. | | | | | - | 5.00 |
| TOU On-Peak Surcharge - ($/kWh) | | | | | | 0.00000 |
| TOU Off-Peak Credit - ($/kWh) | | | | | | 0.00000 |

| CARE | Tier | Sales (GWh) | % of Sales | Pre-Crisis 2001 Rate | Rate | CARE Rate |
|---|---|---|---|---|---|---|
| | 1 | 4,579 | 58% | 10.1 | 8.5 | 8.5 |
| | 2 | 2,148 | 27% | 12.0 | 10.7 | 10.7 |
| | 3 | - | 0% | 12.0 | 20.7 | 18.5 |
| | 4 | 749 | 9% | 12.0 | 20.7 | 18.5 |
| | 5 | 435 | 6% | 12.0 | 20.7 | 18.5 |
| Flat customer Charge $ / Month | | | | 0.85 | 0.70 | 0.00 |
| | | | | | - | 0.00 |
| Min Charge $/Mo. | | | | | - | 3.30 |

## Figure 7-25 Model Inputs - SCE Transitional Default 3-Tier Rate

**User Define Input Table**

# of Tiers => 3-Tiers

Enter T4 or T5 Delta (cents/kWh) => 3.50

Include SB695 90% Cap?

T1 Increase (Over Current) 15.00%

T2 Increase (Over Current) 40.00%

| Sum/Basic | Win/Basic | Sum/All-Ele | Win/All-Elec |
|---|---|---|---|
| 53 | 53 | 60 | 70 |

| Apply New Baseline % here => | |
|---|---|
| Tier-1 | 100.0% |
| Tier-2 => | 200.0% |
| Tier 3 => | 200.0% |
| Tier 4 => | 300.0% |
| Tier 5 => | 300.0% |

Min Charge Non-CARE ($/Mo.) $ 5.0

Min Charge CARE ($/Mo.) $ 3.3

Customer Charge Type

Flat Customer Charge

Demand Differential Break Point (kW) 6

Flat customer Charge $ / Month $ -

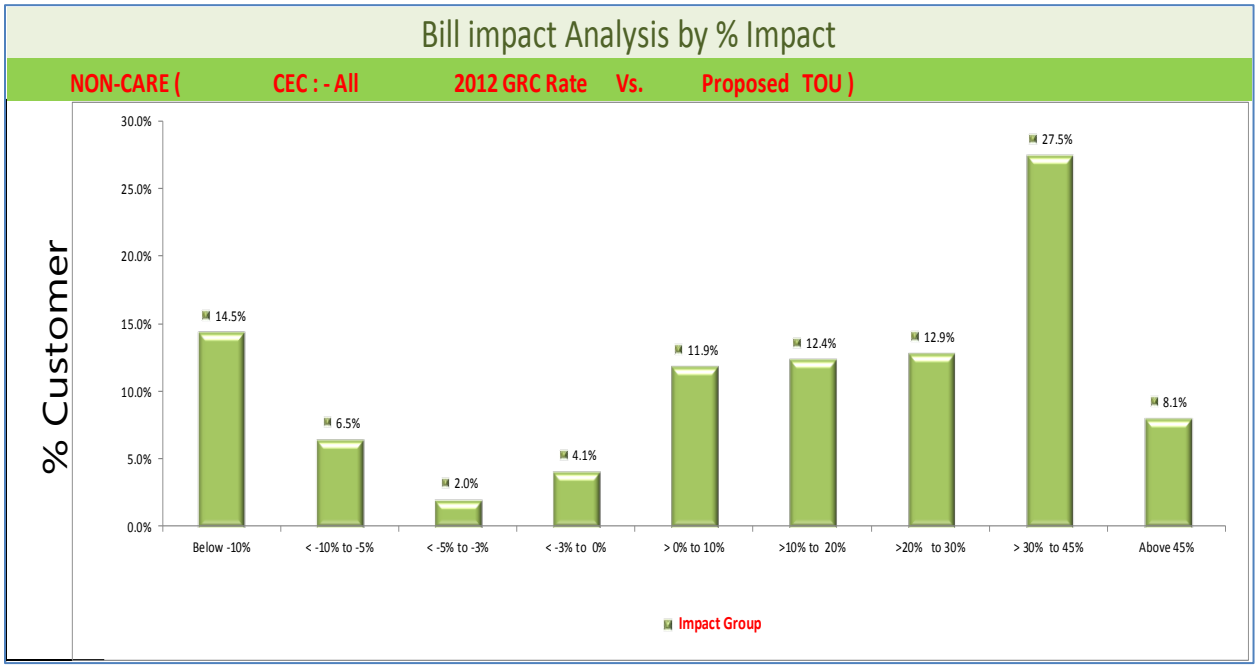
## Figure 7-26 Effective CARE Discount - SCE Transitional Default 3-Tier Rate

| Rate Design Measures | Current Rate Levels | Proposed Rate Levels Non-TOU |
|---|---|---|
| Total Estimated CARE Def. Rev. ($M) => | $ 354 | $ 487 |
| Residential CARE Subsidy ($M) => | $ 88 | $ 121 |
| Non Res. Estimated CARE Subsidy ($M) => | $ 266 | $ 366 |
| Effective CARE Discount % => | 27% | 35% |
| % of Rev. Req. met by Fixed Charges=> | 1% | 0% |
| Sum of Absolute Value Deviations from Cost | 35.4% | 33.1% |
| Change in Usage Due to Elasticity | | -15.9 GWh |
| Ratio of Δ in kWh to Total kWh | | -0.06% |

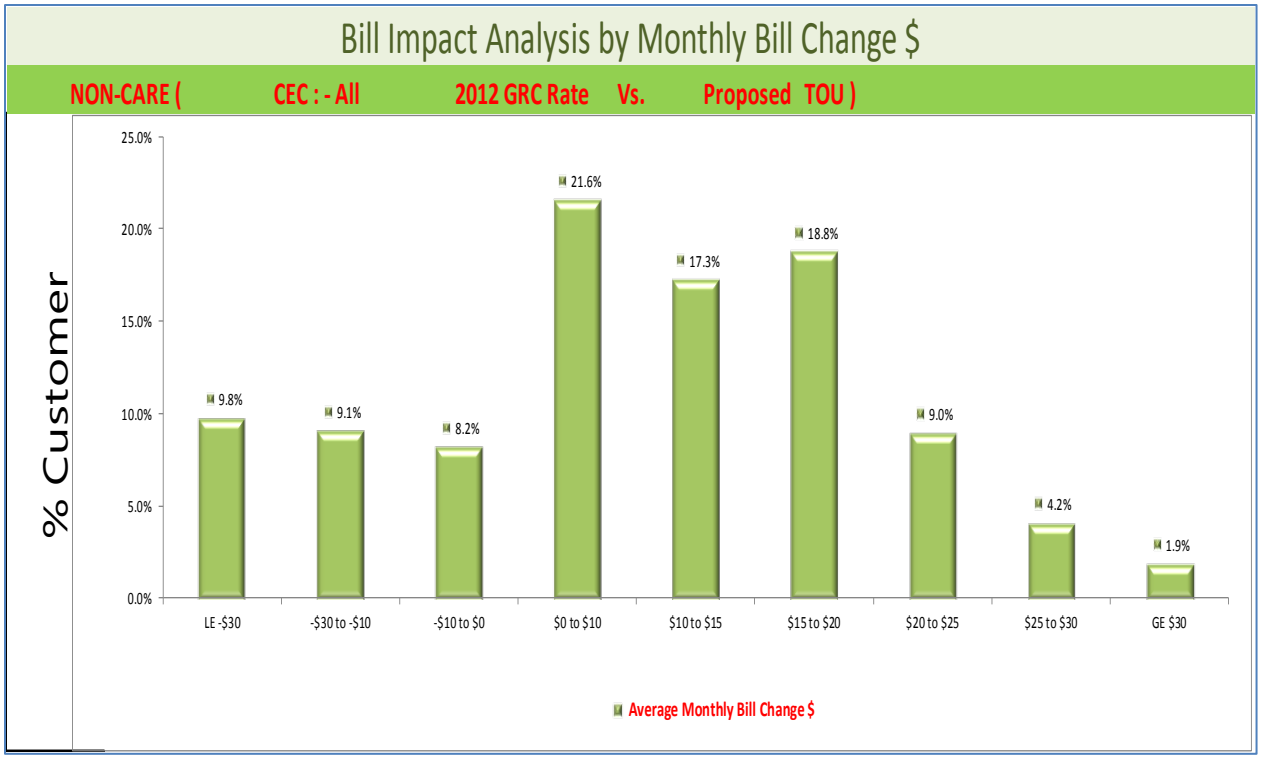
### SCE End State Default TOU Non-CARE

Figure 7-27 indicates that approximately 27% may experience a bill reduction, 24% may experience a 0-20% bill increase, 40% may experience a 20-45% bill increase, and 8% may experience above a 45% increase. About 27% of customers could experience a bill decrease, 21% of customers could experience a $0-$10 bill increase, 26% of customers could experience a $10-$20 bill increase, 13% of customers could experience a $20-$30 bill increase and 2% of customers could experience above a $30 bill increase.

## Figure 7-27 % Bill Impact - SCE End State Default TOU Non-CARE Customers



## Figure 7-28 $ Bill Impact - SCE End State Default TOU Non-CARE Customers




## Table 7-19 % Bill Impact - SCE End State Default TOU Non-CARE Customers

| Impact Group | Customer | | | | Average | | | Elasticity | Cents/kWh | | % | Monthly $ | | Average | Average | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % | Number | % Customer | % Single | %Multi | Monthly - kWh | Annual Load Factor | % On Peak | Average Monthly Δ kWh | 2012 GRC Rate | Proposed | Change | 2012 GRC Rate | Proposed | Monthly $ Change | Current Annual Bill as a % of Income | Proposed Annual Bill as a % of Income |
| Below -10% | 414,425 | 14.5% | 17.7% | 3.6% | 1,220 | 18.6% | 6.5% | 51 | 24.4 | 19.4 | -20.3% | $297.61 | $237.24 | -$60.38 | 2.6% | 2.0% |
| < -10% to -5% | 187,607 | 6.5% | 8.3% | 0.6% | 871 | 16.5% | 7.3% | 14 | 21.3 | 19.7 | -7.7% | $186.04 | $171.78 | -$14.26 | 1.8% | 1.7% |
| < -5% to -3% | 58,370 | 2.0% | 2.5% | 0.6% | 811 | 15.8% | 7.6% | 7 | 20.9 | 20.1 | -3.9% | $169.61 | $162.94 | -$6.68 | 1.7% | 1.7% |
| < -3% to 0% | 118,558 | 4.1% | 5.0% | 1.2% | 783 | 16.1% | 7.4% | 3 | 20.1 | 19.8 | -1.5% | $157.34 | $154.93 | -$2.41 | 1.8% | 1.8% |
| > 0% to 10% | 341,750 | 11.9% | 13.7% | 5.7% | 677 | 14.9% | 7.4% | (7) | 18.8 | 19.7 | 4.6% | $127.56 | $133.47 | $5.91 | 1.4% | 1.5% |
| >10% to 20% | 356,439 | 12.4% | 13.0% | 10.4% | 555 | 13.7% | 7.2% | (17) | 17.1 | 19.6 | 14.4% | $95.26 | $108.97 | $13.71 | 1.1% | 1.3% |
| >20% to 30% | 369,142 | 12.9% | 12.3% | 14.8% | 445 | 11.6% | 6.6% | (23) | 15.6 | 19.5 | 24.6% | $69.45 | $86.55 | $17.09 | 0.9% | 1.1% |
| > 30% to 45% | 787,686 | 27.5% | 20.6% | 50.8% | 297 | 11.1% | 6.1% | (24) | 14.1 | 19.3 | 37.0% | $41.73 | $57.16 | $15.43 | 0.6% | 0.9% |
| Above 45% | 232,092 | 8.1% | 6.9% | 12.3% | 302 | 10.2% | 9.7% | (37) | 13.7 | 20.8 | 51.5% | $41.36 | $62.67 | $21.31 | 0.6% | 1.0% |
| Group Total | 2,866,068 | 100.0% | 100.0% | 100.0% | 589 | 13.6% | 6.9% | (6.6) | 19.4 | 19.6 | 1.0% | $114.38 | $115.51 | $1.13 | 1.4% | 1.4% |

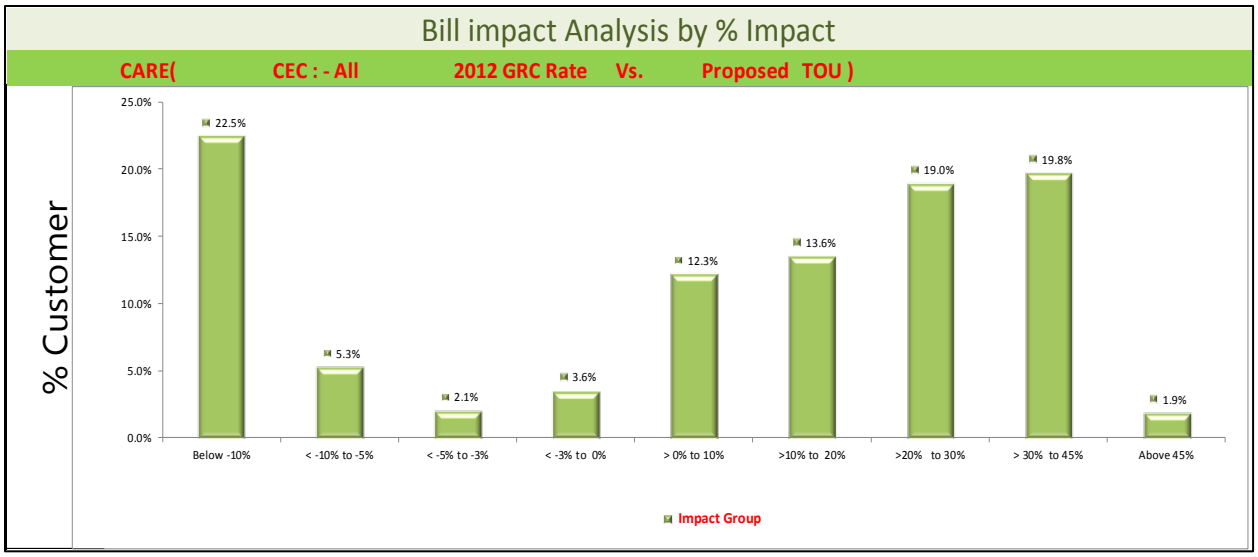
## Table 7-20 $ Bill Impact - SCE End State Default TOU Non-CARE Customers

| Average Monthly Bill Change $ | Customer | | | | Average | | | Elasticity | Cents/kWh | | % | Monthly $ | | Average | Average | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % | Number | % Customer | % Single | %Multi | Monthly - kWh | Annual Load Factor | % On Peak | Average Monthly Δ kWh | 2012 GRC Rate | Proposed | Change | 2012 GRC Rate | Proposed | Monthly $ Change | Current Annual Bill as a % of Income | Proposed Annual Bill as a % of Income |
| LE -$30 | 281,335 | 9.8% | 12.3% | 1.5% | 1,452 | 19.9% | 6.7% | 64 | 25.0 | 19.6 | -21.9% | $363.55 | $284.11 | -$79.44 | 3.0% | 2.3% |
| -$30 to -$10 | 261,181 | 9.1% | 11.4% | 1.4% | 900 | 17.2% | 7.1% | 18 | 21.7 | 19.6 | -9.7% | $195.56 | $176.66 | -$18.90 | 1.9% | 1.7% |
| -$10 to $0 | 236,444 | 8.2% | 9.8% | 3.0% | 702 | 14.5% | 6.7% | 4 | 20.2 | 19.5 | -3.0% | $141.54 | $137.23 | -$4.31 | 1.5% | 1.4% |
| $0 to $10 | 619,479 | 21.6% | 18.8% | 31.3% | 412 | 11.8% | 6.0% | (7) | 17.8 | 19.2 | 7.9% | $73.25 | $79.01 | $5.76 | 0.9% | 1.0% |
| $10 to $15 | 496,297 | 17.3% | 15.0% | 25.1% | 382 | 11.8% | 6.3% | (17) | 16.0 | 19.3 | 20.5% | $61.21 | $73.76 | $12.55 | 0.9% | 1.0% |
| $15 to $20 | 539,006 | 18.8% | 18.5% | 19.8% | 425 | 12.4% | 6.8% | (23) | 15.5 | 19.5 | 26.1% | $65.82 | $83.00 | $17.18 | 0.8% | 1.1% |
| $20 to $25 | 257,670 | 9.0% | 8.9% | 9.2% | 479 | 11.7% | 8.1% | (29) | 15.4 | 20.1 | 30.1% | $73.84 | $96.08 | $22.24 | 1.1% | 1.4% |
| $25 to $30 | 119,022 | 4.2% | 3.9% | 4.9% | 519 | 11.7% | 9.3% | (36) | 15.3 | 20.6 | 34.3% | $79.44 | $106.66 | $27.22 | 1.1% | 1.5% |
| GE $30 | 55,633 | 1.9% | 1.4% | 3.8% | 570 | 13.4% | 12.3% | (52) | 15.6 | 21.9 | 40.3% | $88.99 | $124.88 | $35.88 | 1.5% | 2.1% |
| Group Total | 2,866,068 | 100.0% | 100.0% | 100.0% | 589 | 13.6% | 6.9% | (6.6) | 19.4 | 19.6 | 1.0% | $114.38 | $115.51 | $1.13 | 1.4% | 1.4% |

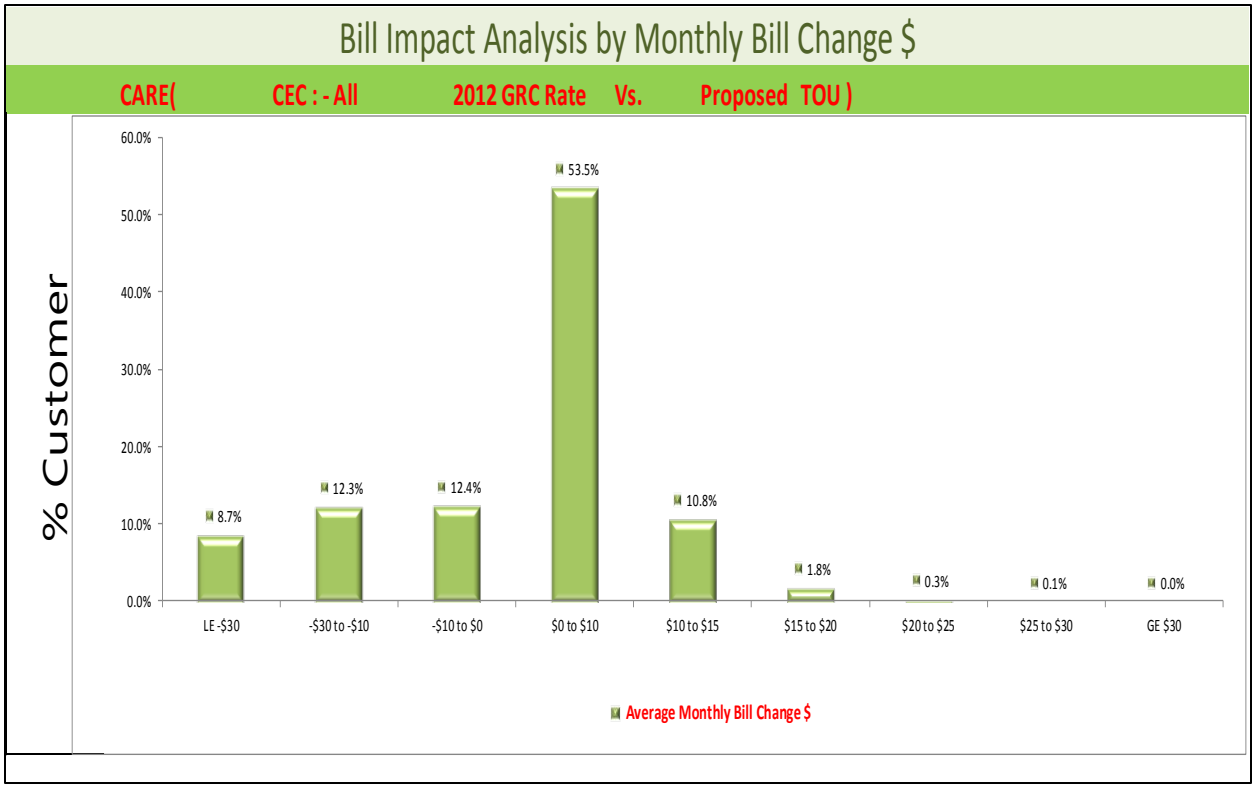
### SCE End State Default TOU CARE

Figure 7-29 indicates that approximately 34% may experience a bill reduction, 26% may experience a 0-20% increase, 39% may experience a 20-45% increase and 2% may experience above a 45% bill increase. About 33% of customers could experience a bill decrease, 54% of customers could experience a $0-$10 bill increase and 3% of customers could experience a $10-$20 bill increase.

## Figure 7-29 % Bill Impact - SCE End State Default TOU CARE Customers



## Figure 7-30 $ Bill Impact - SCE End State Default TOU CARE Customers



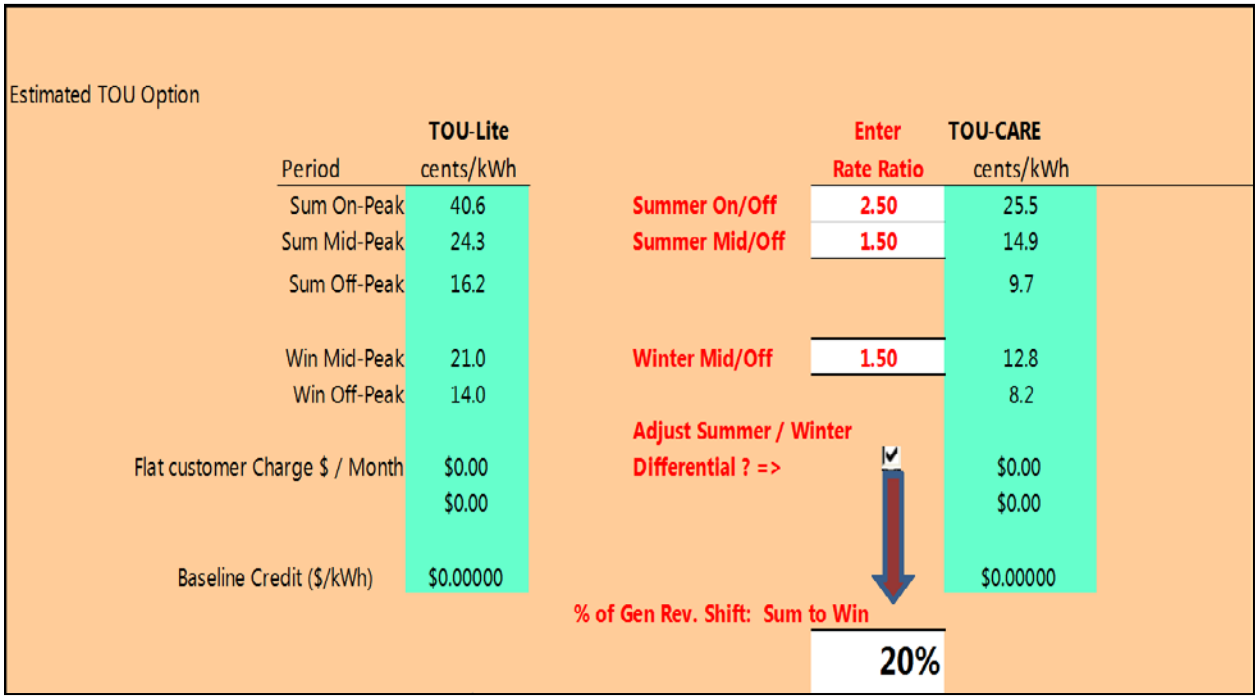

## Table 7-21 % Bill Impact - SCE End State Default TOU CARE Customers

| Impact Group | Customer | | | | Average | | | Elasticity | Cents/kWh | | % | Monthly $ | | Average | Average | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % | Number | % Customer | % Single | %Multi | Monthly - kWh | Annual Load Factor | % On Peak | Average Monthly Δ kWh | 2012 GRC Rate | Proposed | Change | 2012 GRC Rate | Proposed | Monthly $ Change | Current Annual Bill as a % of Income | Proposed Annual Bill as a % of Income |
| Below -10% | 414,425 | 14.5% | 17.7% | 3.6% | 1,220 | 18.6% | 6.5% | 51 | 24.4 | 19.4 | -20.3% | $297.61 | $237.24 | -$60.38 | 2.6% | 2.0% |
| < -10% to -5% | 187,607 | 6.5% | 8.3% | 0.6% | 871 | 16.5% | 7.3% | 14 | 21.3 | 19.7 | -7.7% | $186.04 | $171.78 | -$14.26 | 1.8% | 1.7% |
| < -5% to -3% | 58,370 | 2.0% | 2.5% | 0.6% | 811 | 15.8% | 7.6% | 7 | 20.9 | 20.1 | -3.9% | $169.61 | $162.94 | -$6.68 | 1.7% | 1.7% |
| < -3% to 0% | 118,558 | 4.1% | 5.0% | 1.2% | 783 | 16.1% | 7.4% | 3 | 20.1 | 19.8 | -1.5% | $157.34 | $154.93 | -$2.41 | 1.8% | 1.8% |
| > 0% to 10% | 341,750 | 11.9% | 13.7% | 5.7% | 677 | 14.9% | 7.4% | (7) | 18.8 | 19.7 | 4.6% | $127.56 | $133.47 | $5.91 | 1.4% | 1.5% |
| >10% to 20% | 356,439 | 12.4% | 13.0% | 10.4% | 555 | 13.7% | 7.2% | (17) | 17.1 | 19.6 | 14.4% | $95.26 | $108.97 | $13.71 | 1.1% | 1.3% |
| >20% to 30% | 369,142 | 12.9% | 12.3% | 14.8% | 445 | 11.6% | 6.6% | (23) | 15.6 | 19.5 | 24.6% | $69.45 | $86.55 | $17.09 | 0.9% | 1.1% |
| > 30% to 45% | 787,686 | 27.5% | 20.6% | 50.8% | 297 | 11.1% | 6.1% | (24) | 14.1 | 19.3 | 37.0% | $41.73 | $57.16 | $15.43 | 0.6% | 0.9% |
| Above 45% | 232,092 | 8.1% | 6.9% | 12.3% | 302 | 10.2% | 9.7% | (37) | 13.7 | 20.8 | 51.5% | $41.36 | $62.67 | $21.31 | 0.6% | 1.0% |
| Group Total | 2,866,068 | 100.0% | 100.0% | 100.0% | 589 | 13.6% | 6.9% | (6.6) | 19.4 | 19.6 | 1.0% | $114.38 | $115.51 | $1.13 | 1.4% | 1.4% |

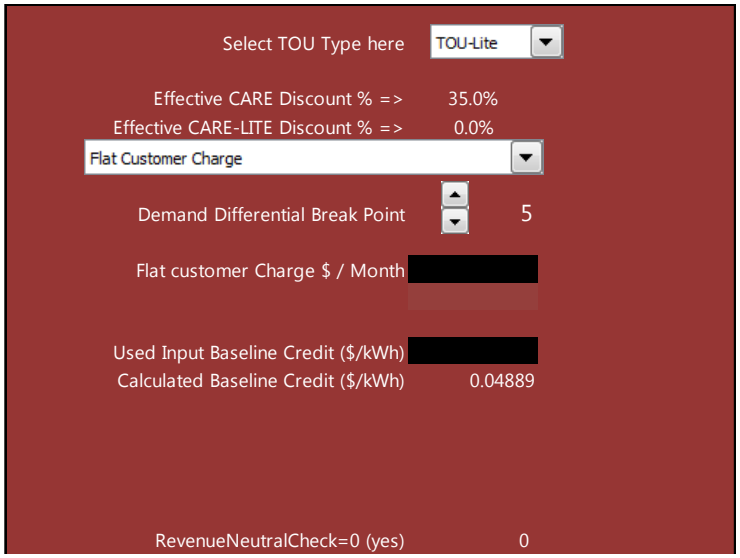
## Table 7-22 $ Bill Impact - SCE End State Default TOU CARE Customers

| Average Monthly Bill Change $ | Customer | | | | Average | | | Elasticity | Cents/kWh | | % | Monthly $ | | Average | Average | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % | Number | % Customer | % Single | %Multi | Monthly - kWh | Annual Load Factor | % On Peak | Average Monthly Δ kWh | 2012 GRC Rate | Proposed | Change | 2012 GRC Rate | Proposed | Monthly $ Change | Current Annual Bill as a % of Income | Proposed Annual Bill as a % of Income |
| LE -$30 | 281,335 | 9.8% | 12.3% | 1.5% | 1,452 | 19.9% | 6.7% | 64 | 25.0 | 19.6 | -21.9% | $363.55 | $284.11 | -$79.44 | 3.0% | 2.3% |
| -$30 to -$10 | 261,181 | 9.1% | 11.4% | 1.4% | 900 | 17.2% | 7.1% | 18 | 21.7 | 19.6 | -9.7% | $195.56 | $176.66 | -$18.90 | 1.9% | 1.7% |
| -$10 to $0 | 236,444 | 8.2% | 9.8% | 3.0% | 702 | 14.5% | 6.7% | 4 | 20.2 | 19.5 | -3.0% | $141.54 | $137.23 | -$4.31 | 1.5% | 1.4% |
| $0 to $10 | 619,479 | 21.6% | 18.8% | 31.3% | 412 | 11.8% | 6.0% | (7) | 17.8 | 19.2 | 7.9% | $73.25 | $79.01 | $5.76 | 0.9% | 1.0% |
| $10 to $15 | 496,297 | 17.3% | 15.0% | 25.1% | 382 | 11.8% | 6.3% | (17) | 16.0 | 19.3 | 20.5% | $61.21 | $73.76 | $12.55 | 0.9% | 1.0% |
| $15 to $20 | 539,006 | 18.8% | 18.5% | 19.8% | 425 | 12.4% | 6.8% | (23) | 15.5 | 19.5 | 26.1% | $65.82 | $83.00 | $17.18 | 0.8% | 1.1% |
| $20 to $25 | 257,670 | 9.0% | 8.9% | 9.2% | 479 | 11.7% | 8.1% | (29) | 15.4 | 20.1 | 30.1% | $73.84 | $96.08 | $22.24 | 1.1% | 1.4% |
| $25 to $30 | 119,022 | 4.2% | 3.9% | 4.9% | 519 | 11.7% | 9.3% | (36) | 15.3 | 20.6 | 34.3% | $79.44 | $106.66 | $27.22 | 1.1% | 1.5% |
| GE $30 | 55,633 | 1.9% | 1.4% | 3.8% | 570 | 13.4% | 12.3% | (52) | 15.6 | 21.9 | 40.3% | $88.99 | $124.88 | $35.88 | 1.5% | 2.1% |
| Group Total | 2,866,068 | 100.0% | 100.0% | 100.0% | 589 | 13.6% | 6.9% | (6.6) | 19.4 | 19.6 | 1.0% | $114.38 | $115.51 | $1.13 | 1.4% | 1.4% |

## Figure 7-31 Model Inputs - SCE End State Default TOU Rate



## Figure 7-32 Effective CARE Discount - SCE End State Default TOU



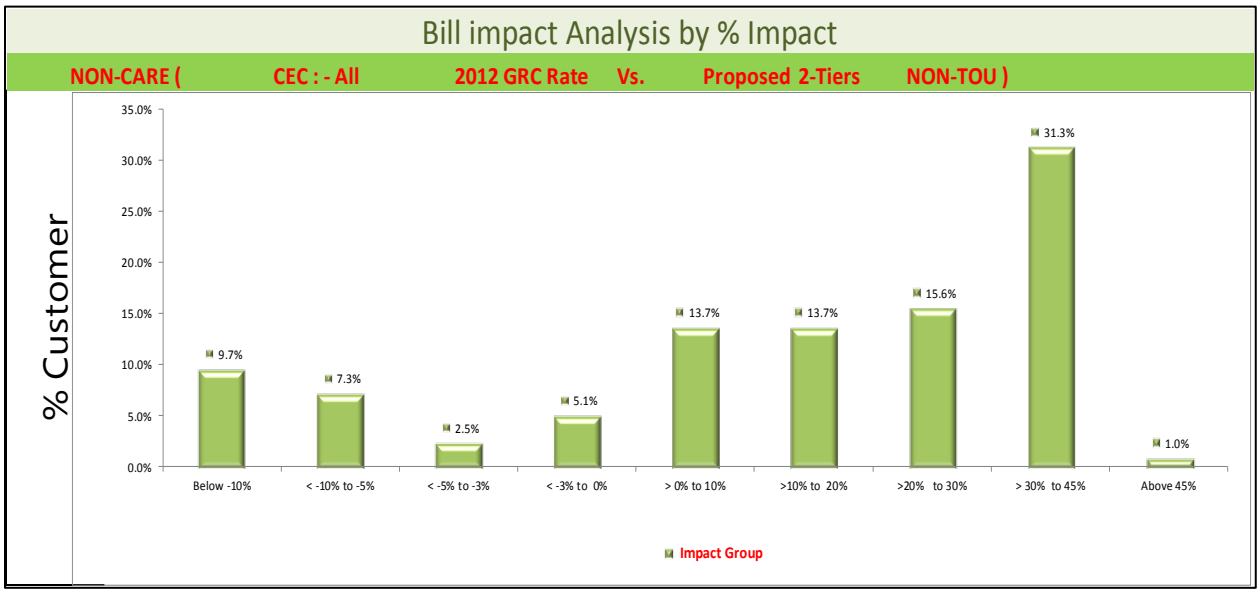

## Figure 7-33 Effective CARE Discount - SCE End-State Default TOU Rate

| Rate Design Measures | Current Rate Levels | Proposed Rate Levels Non-TOU | Proposed Rate Levels TOU |
|---|---|---|---|
| Total Estimated CARE Def. Rev. ($M) => | $ 354 | $ 487 | $ 506 |
| Residential CARE Subsidy ($M) => | $ 88 | $ 121 | $ 126 |
| Non Res. Estimated CARE Subsidy ($M) => | $ 266 | $ 366 | $ 380 |
| Effective CARE Discount % => | 27% | 35% | 35% |
| % of Rev. Req. met by Fixed Charges=> | 1% | 0% | 0% |
| Sum of Absolute Value Deviations from Cost | 35.4% | 33.1% | 24.1% |
| Change in Usage Due to Elasticity | | -15.9 GWh | -221.2 GWh |
| Ratio of Δ in kWh to Total kWh | | -0.06% | -0.81% |

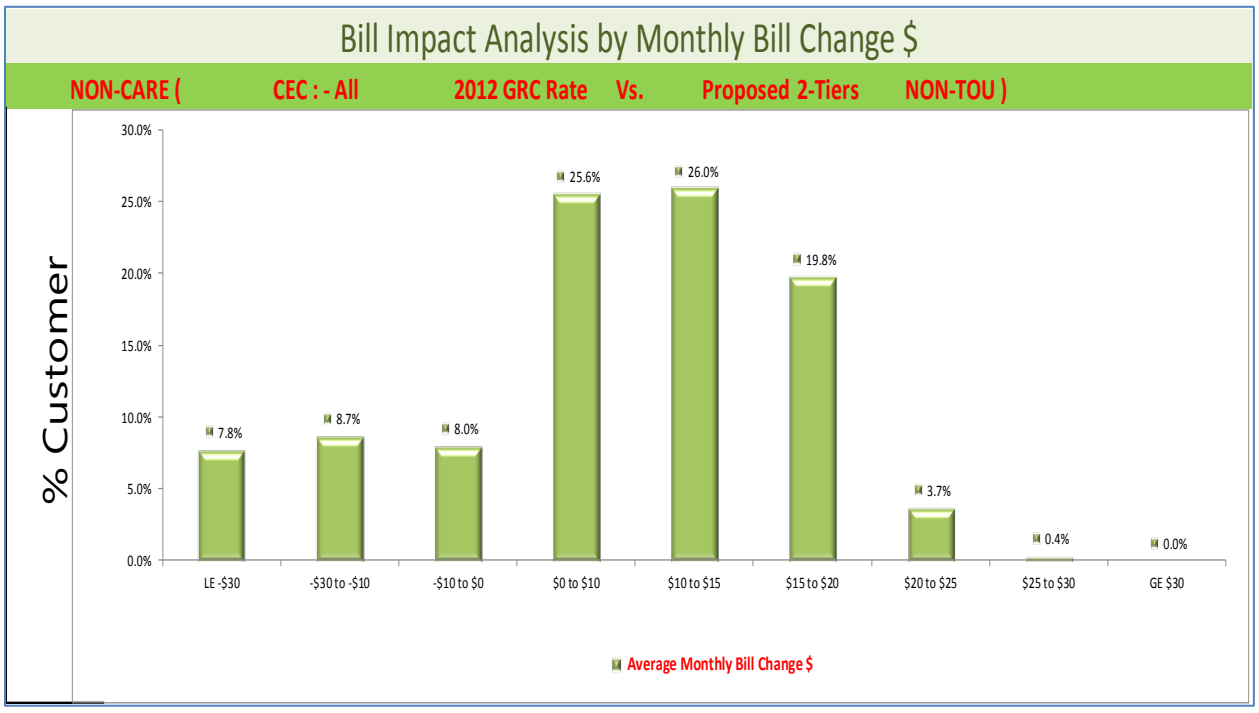
### SCE End State Optional 2-Tier Non-CARE

Figure 7-34 indicates that approximately 25% of customers may experience a bill reduction, 27% may experience a 0-20% increase and 47% may experience a 20-45% increase. About 25% of customers could experience a bill decrease, 26% of customers could experience a bill increase from $0-$10, 46% of customers could experience a bill increase from $10-$20, and 4% of customers could experience a bill increase from $20-$30 according to Figure7-35.

## Figure 7-34 % Bill Impact - SCE End State Optional 2-Tier Non-CARE Customers




## Figure 7-35 $ Bill Impact - SCE End State Optional 2-Tier Non-CARE Customers



## Table 7-23 % Bill Impact - SCE End State Optional 2-Tier Non-CARE Customers

| Impact Group | Customer | | | | Average | | | Elasticity | Cents/kWh | | % | Monthly $ | | Average | Average | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % | Number | % Customer | % Single | %Multi | Monthly - kWh | Annual Load Factor | % On Peak | Average Monthly Δ kWh | 2012 GRC Rate | Proposed | Change | 2012 GRC Rate | Proposed | Monthly $ Change | Current Annual Bill as a % of Income | Proposed Annual Bill as a % of Income |
| Below -10% | 277,045 | 9.7% | 12.1% | 1.3% | 1,456 | 19.6% | 7.5% | 52 | 25.1 | 20.7 | -17.5% | $365.07 | $301.08 | -$63.99 | 3.1% | 2.6% |
| < -10% to -5% | 208,801 | 7.3% | 9.1% | 1.2% | 937 | 17.4% | 7.3% | 15 | 21.9 | 20.2 | -7.7% | $205.47 | $189.57 | -$15.90 | 2.0% | 1.9% |
| < -5% to -3% | 70,839 | 2.5% | 3.1% | 0.5% | 827 | 16.5% | 7.1% | 7 | 20.9 | 20.1 | -4.2% | $173.28 | $166.03 | -$7.25 | 1.7% | 1.6% |
| < -3% to 0% | 147,014 | 5.1% | 6.3% | 1.0% | 783 | 16.0% | 7.4% | 2 | 20.2 | 19.9 | -1.4% | $158.55 | $156.28 | -$2.27 | 1.6% | 1.6% |
| > 0% to 10% | 393,895 | 13.7% | 16.3% | 5.1% | 677 | 15.0% | 7.3% | (7) | 18.8 | 19.7 | 4.6% | $127.49 | $133.38 | $5.89 | 1.5% | 1.6% |
| >10% to 20% | 393,895 | 13.7% | 14.6% | 11.0% | 545 | 13.5% | 6.8% | (17) | 16.8 | 19.3 | 15.0% | $91.34 | $105.05 | $13.71 | 1.1% | 1.2% |
| >20% to 30% | 448,189 | 15.6% | 14.6% | 19.0% | 406 | 11.7% | 6.7% | (21) | 15.1 | 18.8 | 24.8% | $61.28 | $76.49 | $15.21 | 0.8% | 1.0% |
| > 30% to 45% | 898,331 | 31.3% | 23.4% | 58.4% | 277 | 10.6% | 5.5% | (19) | 13.6 | 18.2 | 33.8% | $37.65 | $50.38 | $12.74 | 0.6% | 0.8% |
| Above 45% | 28,059 | 1.0% | 0.5% | 2.5% | 35 | 4.1% | 3.5% | (5) | 15.6 | 28.4 | 81.5% | $5.50 | $9.99 | $4.48 | 0.1% | 0.1% |
| Group Total | 2,866,068 | 100.0% | 100.0% | 100.0% | 589 | 13.6% | 6.9% | (4.9) | 19.4 | 19.7 | 1.3% | $114.38 | $115.90 | $1.53 | 1.4% | 1.4% |

## Table 7-24 $ Bill Impact - SCE End State Optional 2-Tier Non-CARE Customers

| Average Monthly Bill Change $ | Customer | | | | Average | | | Elasticity | Cents/kWh | | % | Monthly $ | | Average | Average | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % | Number | % Customer | % Single | %Multi | Monthly - kWh | Annual Load Factor | % On Peak | Average Monthly Δ kWh | 2012 GRC Rate | Proposed | Change | 2012 GRC Rate | Proposed | Monthly $ Change | Current Annual Bill as a % of Income | Proposed Annual Bill as a % of Income |
| LE -$30 | 223,252 | 7.8% | 9.7% | 1.2% | 1,564 | 19.8% | 7.4% | 57 | 25.4 | 20.7 | -18.3% | $396.98 | $324.19 | -$72.79 | 3.3% | 2.7% |
| -$30 to -$10 | 249,817 | 8.7% | 10.9% | 1.3% | 963 | 18.0% | 7.5% | 17 | 22.2 | 20.3 | -8.5% | $213.24 | $195.01 | -$18.23 | 2.1% | 1.9% |
| -$10 to $0 | 230,631 | 8.0% | 10.0% | 1.4% | 787 | 15.9% | 7.2% | 4 | 20.5 | 20.0 | -2.5% | $161.40 | $157.33 | -$4.07 | 1.6% | 1.6% |
| $0 to $10 | 732,586 | 25.6% | 22.8% | 34.9% | 415 | 11.5% | 6.7% | (8) | 18.0 | 19.5 | 8.1% | $74.63 | $80.69 | $6.06 | 1.0% | 1.1% |
| $10 to $15 | 743,800 | 26.0% | 23.2% | 35.5% | 388 | 12.1% | 6.6% | (17) | 15.6 | 18.9 | 20.6% | $60.74 | $73.25 | $12.51 | 0.8% | 1.0% |
| $15 to $20 | 567,925 | 19.8% | 20.1% | 18.9% | 454 | 12.4% | 6.4% | (23) | 15.1 | 18.8 | 24.8% | $68.50 | $85.51 | $17.01 | 0.9% | 1.1% |
| $20 to $25 | 106,865 | 3.7% | 3.0% | 6.1% | 557 | 12.6% | 6.5% | (30) | 14.8 | 18.7 | 26.4% | $82.59 | $104.42 | $21.84 | 1.0% | 1.3% |
| $25 to $30 | 10,614 | 0.4% | 0.3% | 0.5% | 700 | 13.3% | 5.6% | (36) | 15.0 | 18.8 | 25.6% | $104.62 | $131.46 | $26.84 | 1.7% | 2.1% |
| GE $30 | 579 | 0.0% | 0.0% | 0.1% | 629 | 6.8% | 0.0% | (46) | 13.2 | 18.1 | 36.7% | $83.23 | $113.77 | $30.54 | 0.4% | 0.5% |
| Group Total | 2,866,068 | 100.0% | 100.0% | 100.0% | 589 | 13.6% | 6.9% | (4.9) | 19.4 | 19.7 | 1.3% | $114.38 | $115.90 | $1.53 | 1.4% | 1.4% |

## Figure 7-36 SCE End State Optional 2-Tier Non-CARE and CARE Rates

**Estimated Residential Rate Calculated based on Inputs**

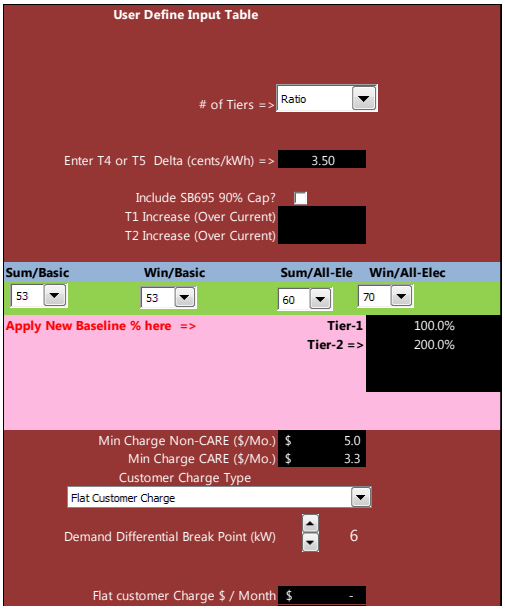
Select Ratio Here: 2-Tiers

| Non-CARE | Tier | Forecast Sales (GWh) | % of Sales | Pre-Crisis 2001 Rate | 2012 GRC Rate | 2-Tiers Rate |
|---|---|---|---|---|---|---|
| | 1 | 10,117 | 52% | 12.0 | 13.0 | 17.9 |
| | 2 | 5,392 | 28% | 14.2 | 16.0 | 21.5 |
| | 3 | 1,717 | 9% | 14.2 | 27.1 | 21.5 |
| | 4 | 869 | 5% | 14.2 | 31.1 | 21.5 |
| | 5 | 1,185 | 6% | 14.2 | 31.1 | 21.5 |
| Flat customer Charge $ / Month | | | | 1.00 | 0.88 | 0.00 |
| | | | | | | 0.00 |
| Min Charge $/Mo. | | | | | - | 5.00 |
| TOU On-Peak Surcharge - ($/kWh) | | | | | | 0.00000 |
| TOU Off-Peak Credit - ($/kWh) | | | | | | 0.00000 |

| CARE | Tier | Sales (GWh) | % of Sales | Pre-Crisis 2001 Rate | Rate | CARE Rate |
|---|---|---|---|---|---|---|
| | 1 | 4,787 | 61% | 10.1 | 8.5 | 10.8 |
| | 2 | 2,087 | 26% | 12.0 | 10.7 | 13.1 |
| | 3 | 546 | 7% | 12.0 | 20.7 | 13.1 |
| | 4 | 258 | 3% | 12.0 | 20.7 | 13.1 |
| | 5 | 233 | 3% | 12.0 | 20.7 | 13.1 |
| Flat customer Charge $ / Month | | | | 0.85 | 0.70 | 0.00 |
| | | | | | - | 0.00 |
| Min Charge $/Mo. | | | | | - | 3.30 |

1.2

## Figure 7-37 Model Inputs - SCE End State Optional 2-Tier Rate



### SCE End State Optional 2-Tier CARE

Figure 7-38 indicates that approximately 34% of customers may experience a bill reduction, 36% may experience a 0-20% increase, and 30% may experience a 20-45% increase. About 34% of customers could experience a bill decrease, 66% of customers could experience a $0-$10 bill increase, and 1% of customers could experience a $10-$20 bill increase according to Figure 7-39.

**Figure 7-38 % Bill Impact - SCE End State Optional 2-Tier CARE Customers**

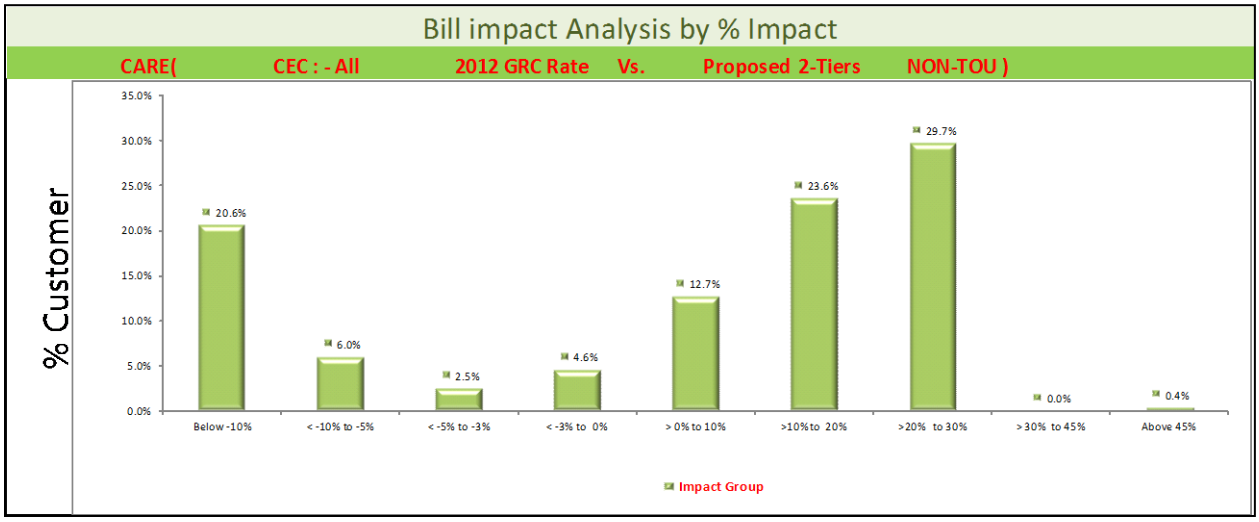
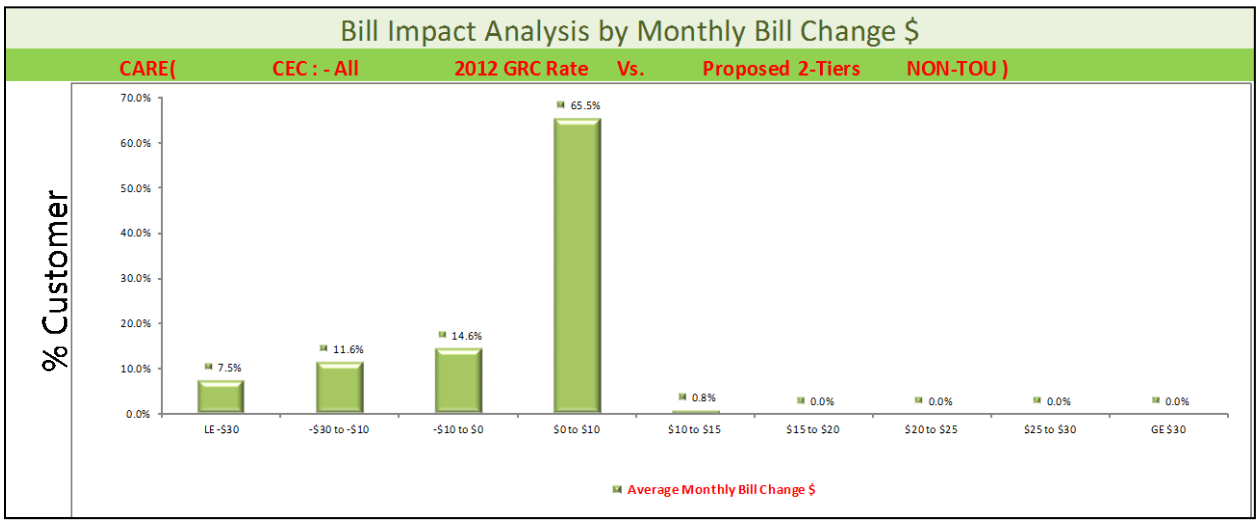



**Figure 7-39 $ Bill Impact - SCE End State Optional 2-Tier CARE Customers**



## Table 7-25 % Bill Impact - SCE End State Optional 2-Tier CARE Customers

| Impact Group | Customer | | | | Average | | | Elasticity | Cents/kWh | | % | Monthly $ | | Average | Average | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % | Number | % Customer | % Single | %Multi | Monthly - kWh | Annual Load Factor | % On Peak | Average Monthly Δ kWh | 2012 GRC Rate | Proposed | Change | 2012 GRC Rate | Proposed | Monthly $ Change | Current Annual Bill as a % of Income | Proposed Annual Bill as a % of Income |
| Below -10% | 284,405 | 20.6% | 28.4% | 5.6% | 990 | 19.9% | 8.4% | 40 | 15.2 | 12.3 | -19.5% | $150.66 | $121.29 | -$29.37 | 2.4% | 1.9% |
| < -10% to -5% | 83,181 | 6.0% | 7.1% | 3.9% | 670 | 18.2% | 8.3% | 11 | 12.9 | 11.9 | -7.7% | $86.22 | $79.59 | -$6.63 | 1.3% | 1.2% |
| < -5% to -3% | 34,502 | 2.5% | 3.3% | 0.9% | 621 | 17.9% | 8.0% | 5 | 12.2 | 11.8 | -3.8% | $76.05 | $73.14 | -$2.91 | 1.5% | 1.5% |
| < -3% to 0% | 62,904 | 4.6% | 5.6% | 2.6% | 603 | 15.6% | 7.4% | 2 | 11.9 | 11.7 | -1.4% | $71.54 | $70.56 | -$0.99 | 1.2% | 1.1% |
| > 0% to 10% | 175,789 | 12.7% | 14.8% | 8.8% | 513 | 16.0% | 8.1% | (5) | 11.0 | 11.5 | 4.6% | $56.51 | $59.09 | $2.58 | 1.0% | 1.1% |
| >10% to 20% | 325,575 | 23.6% | 19.8% | 30.8% | 328 | 13.2% | 7.7% | (11) | 9.7 | 11.2 | 15.2% | $31.85 | $36.70 | $4.85 | 0.6% | 0.7% |
| >20% to 30% | 409,792 | 29.7% | 20.7% | 47.0% | 274 | 13.0% | 7.2% | (13) | 8.9 | 10.9 | 22.2% | $24.52 | $29.96 | $5.44 | 0.6% | 0.7% |
| > 30% to 45% | 0 | 0.0% | 0.0% | 0.0% | 0 | 0.0% | 0.0% | 0 | 0.0 | 0.0 | 0.0% | $0.00 | $0.00 | $0.00 | 0.0% | 0.0% |
| Above 45% | 4,909 | 0.4% | 0.3% | 0.4% | 19 | 2.2% | 4.0% | (2) | 12.5 | 20.1 | 60.9% | $2.41 | $3.88 | $1.47 | 0.0% | 0.1% |
| Group Total | 1,381,056 | 100.0% | 100.0% | 100.0% | 509 | 15.3% | 8.0% | 1.3 | 12.4 | 11.7 | -5.3% | $62.92 | $59.56 | -$3.35 | 1.2% | 1.1% |

## Table 7-26 $ Bill Impact - SCE End State Optional 2-Tier CARE Customers

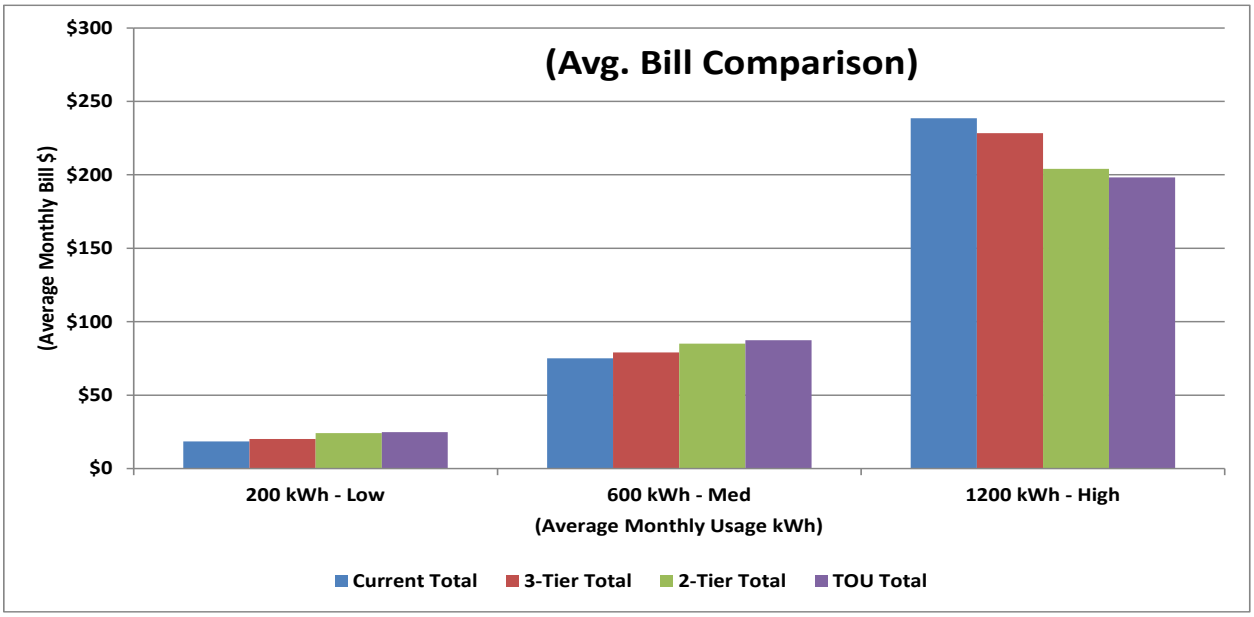
| Average Monthly Bill Change $ | Customer | | | | Average | | | Elasticity | Cents/kWh | | % | Monthly $ | | Average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % | Number | % Customer | % Single | %Multi | Monthly - kWh | Annual Load Factor | % On Peak | Average Monthly ? kWh | 2012 GRC Rate | Proposed | Change | 2012 GRC Rate | Proposed | Monthly $ Change |
| LE -$30 | 103,041 | 7.5% | 10.3% | 1.9% | 1,269 | 21.8% | 7.9% | 62 | 16.3 | 12.4 | -23.8% | $206.94 | $157.61 | -$49.33 |
| -$30 to -$10 | 160,349 | 11.6% | 16.1% | 2.9% | 888 | 19.1% | 9.2% | 26 | 14.3 | 12.1 | -15.3% | $127.03 | $107.54 | -$19.49 |
| -$10 to $0 | 201,601 | 14.6% | 17.9% | 8.3% | 611 | 16.9% | 7.5% | 7 | 12.5 | 11.8 | -5.4% | $76.25 | $72.15 | -$4.09 |
| $0 to $10 | 904,889 | 65.5% | 55.1% | 85.6% | 333 | 13.6% | 7.7% | (10) | 9.8 | 11.2 | 14.0% | $32.67 | $37.26 | $4.59 |
| $10 to $15 | 11,176 | 0.8% | 0.5% | 1.4% | 668 | 12.4% | 6.3% | (25) | 9.5 | 11.2 | 18.0% | $63.09 | $74.43 | $11.35 |
| $15 to $20 | 0 | 0.0% | 0.0% | 0.0% | 0 | 0.0% | 0.0% | 0 | 0.0 | 0.0 | 0.0% | $0.00 | $0.00 | $0.00 |
| $20 to $25 | 0 | 0.0% | 0.0% | 0.0% | 0 | 0.0% | 0.0% | 0 | 0.0 | 0.0 | 0.0% | $0.00 | $0.00 | $0.00 |
| $25 to $30 | 0 | 0.0% | 0.0% | 0.0% | 0 | 0.0% | 0.0% | 0 | 0.0 | 0.0 | 0.0% | $0.00 | $0.00 | $0.00 |
| GE $30 | 0 | 0.0% | 0.0% | 0.0% | 0 | 0.0% | 0.0% | 0 | 0.0 | 0.0 | 0.0% | $0.00 | $0.00 | $0.00 |
| Group Total | 1,381,056 | 100.0% | 100.0% | 100.0% | 509 | 15.3% | 8.0% | 1.3 | 12.4 | 11.7 | -5.3% | $62.92 | $59.56 | -$3.35 |

**Bill Impact vs. Average Monthly Usage**

Figures 7-40 and 7-41 illustrate average monthly bills in 2012 dollars for PG&E and SCE low (200 kWh), medium (600 kWh) and high (1200 kWh) usage customers subscribed to cost-based, current, transitional default 3-tier, and end-state default TOU or optional 2-tier rates[195].

According to Figure 7-40, PG&E low usage customers on a transitional default 3-tier rate structure may experience a 9% or $2 bill increase, medium usage customers may experience a 5% or $4 bill increase, and high usage customers may experience a 4% or $10 bill decrease. PG&E low usage customers on an end-state default TOU rate structure may experience a 31% or $6 bill increase, medium usage customers may experience a 13% or $10 bill increase, and high usage customers may experience a 14% or $34 bill decrease. PG&E low usage customers on an end-state optional 2-tier rate structure may experience a 35% or $6 bill increase, medium usage customers may experience a 17% or $12 bill increase, and high usage customers may experience a 17% or $40 bill decrease.

**Figure 7-40 $ Bill Impact vs. Average Monthly Usage – PG&E Customers**



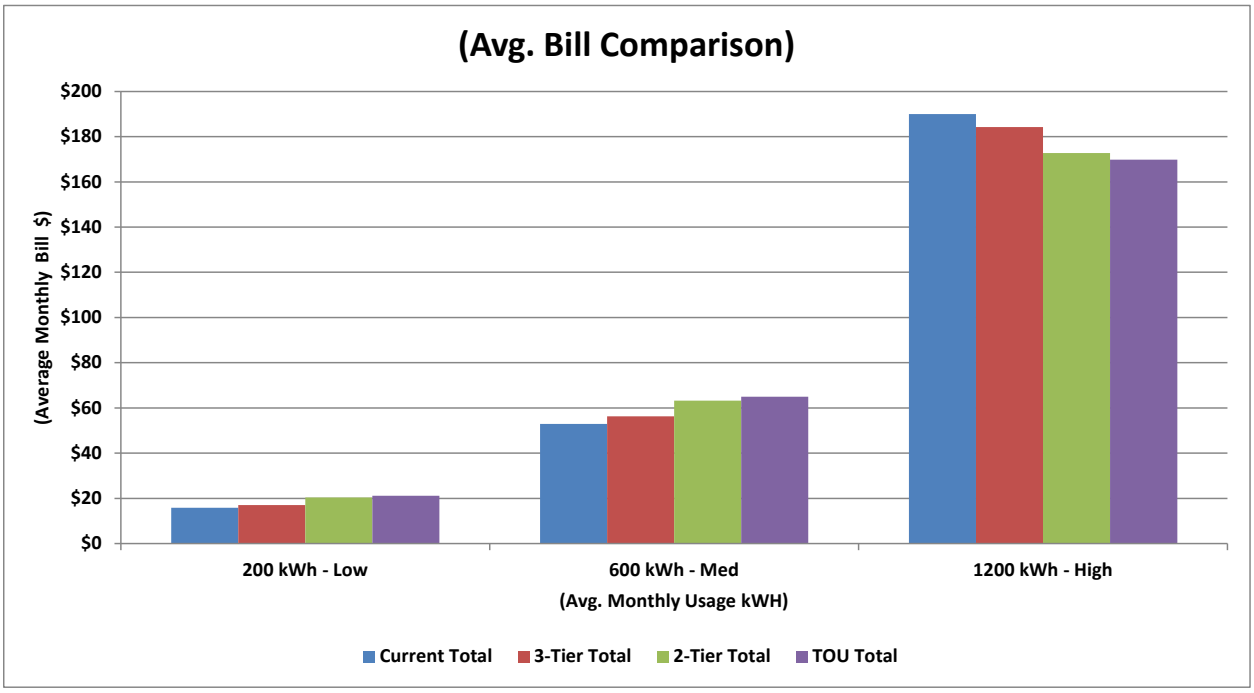

[195] Results monthly average % and $ bill impacts for all customers (i.e. Non-CARE and CARE customers) with either low, medium or high usage.

## Table 7-27 $ Bill Impact vs. Average Monthly Usage – PG&E Customers

| Avg. Usage @ | 2012 Total | 3-Tier Total | Δ dollars from 2012 | Δ percent from 2012 | 2-Tier Total | Δ dollars from 2012 | Δ percent from 2012 | TOU Total | Δ dollars from 2012 | Δ percent from 2012 |
|---|---|---|---|---|---|---|---|---|---|---|
| 200 kWh - Low | $18.42 | $20.09 | $1.67 | 9% | $24.21 | $5.79 | 31% | $24.80 | $6.38 | 35% |
| 600 kWh - Med | $75.05 | $79.00 | $3.95 | 5% | $85.04 | $9.99 | 13% | $87.43 | $12.38 | 16% |
| 1200 kWh - High | $238.50 | $228.29 | -$10.21 | -4% | $204.03 | -$34.47 | -14% | $198.27 | -$40.23 | -17% |

According to Figure 7-41, SCE low usage customers on a transitional default 3-tier rate structure may experience a 8% or $1 bill increase, medium usage customers may experience a 6% or $3 bill increase, and high usage customers may experience a 3% or $6 bill decrease. SCE low usage customers on an end-state optional 2-tier rate structure may experience a 29% or $5 bill increase, medium usage customers may experience a 19% or $10 bill increase, and high usage customers may experience a 9% or $17 bill decrease. SCE low usage customers on an end-state default TOU rate structure may experience a 33% or $5 bill increase, medium usage customers may experience a 23% or $12 bill increase, and high usage customers may experience a 11% or $20 bill decrease.

## Figure 7-41 $ Bill Impact vs. Average Monthly Usage –SCE Customers



### Table 7-28 $ Bill Impact vs. Average Monthly Usage – SCE Customers

| Avg. Usage @ | 2012 Total | 3-Tier Total | Δ dollars from 2012 | Δ percent from 2012 | 2-Tier Total | Δ dollars from 2012 | Δ percent from 2012 | TOU Total | Δ dollars from 2012 | Δ percent from 2012 |
|---|---|---|---|---|---|---|---|---|---|---|
| 200 kWh - Low | $15.85 | $17.05 | $1.20 | 8% | $20.42 | $4.57 | 29% | $21.15 | $5.30 | 33% |
| 600 kWh - Med | $52.91 | $56.32 | $3.41 | 6% | $63.20 | $10.29 | 19% | $65.01 | $12.10 | 23% |
| 1200 kWh - High | $190.00 | $184.21 | -$5.79 | -3% | $172.71 | -$17.29 | -9% | $169.78 | -$20.22 | -11% |

**Energy Conservation and Peak Load Shifting Effect of Illustrative Rates**

The impacts generated in the utility bill calculator models are static. The models assume the same billing determinants when comparing present to modeled rates and thus do not reflect any change in consumption resulting from the alternative rates. PG&E developed an "Energy Conservation Tab" in its model using a basic elasticity of demand sidebar tool[196] which allows the user to see the change in consumption between two sets of end-state rates compared to present rates based on user-defined elasticity inputs. These results can only be seen outside of the main model. PG&E defined price elasticity as -0.20% based on the often sited estimate of elasticity developed by Faruqui's "meta-analysis" of dynamic pricing studies.[197]

Based on the results of the PG&E model staff found that its end-state TOU rate leads to a 3.4% overall reduction in consumption and the end-state 2 tier rates leads to 3.2% conservation. In addition the TOU rate reduces peak demand by 12% and reduces semi-peak demand by 3%. If these results were factored into the bill impacts then two important additional benefits would be observed:

- Overall bill impacts would be lower across the board for customers.
- The TOU rate would lead to lower overall system cost.

### Table 7-29 – PG&E Customer Energy Consumption Change – 2-Tiered & TOU Rate Designs

| Total Energy Conservation | 2-Tier | TOU |
|---|---|---|
| % Annual Energy Conserved | 3.20% | 3.40% |

[196] See PG&E Bill Impact Model User Guide Appendix F "Conservation Tab"

[197] "A Meta-Analysis of Dynamic Pricing Studies- Some Initial Findings", by Ahmad Faruqui, Sanem Sergici, and Eric Shultz, Brattle Group, 2012.

### Table 7-30 –PG&E Customer Energy Consumption Change – TOU Period & Season

| Energy Consumption Change By TOU Period and Season | Non-CARE | CARE |
|---|---|---|
| % Energy Consumption Change Summer On-Peak | -12% | -12% |
| % Energy Consumption Change Summer Part-Peak | -3% | -3% |
| % Energy Consumption Change Summer Off-Peak | 5% | 5% |
| | | |
| % Energy Consumption Change Winter Part-Peak | -3% | -3% |
| % Energy Consumption Change Winter Off-Peak | 1% | 1% |

According to Table 7-29, illustrative PG&E 2-tiered and TOU rate designs promote a modest degree of energy consumption change. However, PG&E TOU rate design model results also indicate that 12% of Non-CARE and CARE customer usage is reduced during the summer on-peak period. In addition, a modest degree of energy reduction (3%) is observed during both the summer and winter part-peak periods. Thus while overall conservation is comparable under either end-state rate, conservation under the TOU rate is expected to occur when it is most valuable.

# 8 APPENDIX B: ENERGY DIVISION AND PARTY PROPOSED ILLUSTRATIVE RATES

## Table 8-1

## Energy Division[198] & Party Proposed Illustrative Rates – PG&E Non-CARE

| Energy Division and Party Proposed Rate Designs - PG&E Non-CARE | Tiered Rate Structure (c/kWh) | | | | TOU Rate Structure (c/kWh) | | | | | Baseline & Off-Peak Credit, On-Peak Surcharge, Average Rate (c/kWh), Demand & Customer Charge, Minimum Bill ($/mo.) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | T1 | T2 | T3 | T4 | Sum On-Peak | Sum Mid-Peak | Sum Off-Peak | Win Mid-Peak | Win Off-Peak | Baseline Credit | TOU On-Peak Surcharge | TOU Part-Peak Surcharge | TOU Off-Peak Credit | Ave. Rate [1] | Cust. Charge | Min. Bill |
| PG&E Rates (May 2013) | 13.2 | 15.0 | 31.1 | 35.1 | | | | | | | | | | 18.9 | | 4.5 |
| ED[1] Transitional Default 3-Tier | 14.1 | 21.2 | 30.6 | | | | | | | | | | | 18.1 | | 5.0 |
| ED End-State Default TOU | | | | | 36.8 | 22.0 | 14.7 | 17.6 | 14.7 | | | | | 17.9 | | 5.0 |
| ED End-State Optional 2-Tier | 17.0 | 20.4 | | | | | | | | | | | | 18.0 | | 5.0 |
| PG&E Transitional Default 4-Tier | 14.2 | 16.6 | 24.7 | 26.7 | | | | | | | | | | 18.6 | 5.0 | |
| PG&E Transitional Optional TOU T1 | | | | | 27.1 | 19.7 | 14.0 | 17.2 | 12.1 | 5.0 | | | | 18.3 | 5.0 | |
| PG&E Transitional Optional TOU T2 | | | | | 32.1 | 24.7 | 19.0 | 22.2 | 17.1 | | | | | 18.3 | 5.0 | |
| PG&E End-State Default 2-Tier | 15.2 | 18.2 | | | | | | | | | | | | 18.3 | 10.0 | |
| PG&E End-State Optional TOU | | | | | 25.8 | 19.9 | 15.3 | 17.9 | 13.7 | | | | | 18.2 | 10.0 | |
| DRA Transitional Default TOU | 14.3 | 22.9 | 29.1 | | | | | | | | 4.0 | | 0.6 | 18.4 | | 5.0 |
| DRA Transitional Optional 3-Tier | 14.3 | 22.9 | 29.1 | | | | | | | | | | | 18.5 | | 5.0 |
| DRA End-State Default TOU | | | | | 40.2 | 28.7 | 16.9 | 28.7 | 16.9 | 5.0 | | | | 18.3 | | 5.0 |
| DRA End-State Optional 2-Tier | 16.4 | 21.3 | | | | | | | | | | | | 18.3 | | 5.0 |
| TURN End-State Default 3-Tier | 15.7 | 21.0 | 25.4 | | | | | | | | | | | N/A | | 4.5 |
| NRDC End-State Default TOU, Large Users, T2 | | | | | 18.0 | 12.0 | 6.0 | 12.0 | 6.0 | | 6.0 | | | N/A | | |
| NRDC End-State Default TOU, Large Users, T3 | | | | | 18.0 | 12.0 | 6.0 | 12.0 | 6.0 | | 12.0 | | | N/A | | |
| NRDC End-State Optional 3-Tier, Small Users | 15.7 | 23.6 | 31.5 | | | | | | | | | | | 18.2 [1] | | 4.5 |
| JSC Transitional Default 3-Tier | 12.8 | 14.8 | 31.7 | | | | | | | | | | | 18.3 | | |
| JSC End-State Default TOU T1 | | | | | 28.9 | 18.9 | 11.4 | 13.1 | 11.4 | 9.9 | | | | 18.1 | | |
| JSC End-State Default TOU ≥T2 | | | | | 38.8 | 28.8 | 21.3 | 23.0 | 21.3 | | | | | 18.1 | | |
| JSC End-State Optional 3-Tier | 12.8 | 14.8 | 31.7 | | | | | | | | | | | 18.3 | | |
| Sierra Club End-State Default TOU T1 | | | | | 22.9 | 15.9 | 7.9 | 15.9 | 7.9 | | 10.0 | 3.0 | 4.9 | | | |
| Sierra Club End-State Default TOU T2 | | | | | 30.4 | 23.4 | 15.5 | 23.4 | 15.5 | | 10.0 | 3.0 | 4.9 | | | |
| Sierra Club End-State Default TOU T3 | | | | | 39.4 | 32.4 | 24.4 | 32.4 | 24.4 | | 10.0 | 3.0 | 4.9 | | | |
| Sierra Club End-State Optional 4-Tier | 13.2 | 15.0 | 31.1 | 35.1 | | | | | | | | | | 18.9 | | 4.5 |

[198] ED refers to Energy Division

## Table 8-2

## Energy Division & Party Proposed Illustrative Rates – PG&E CARE

| Energy Division and Party Proposed Rate Designs - PG&E CARE | Tiered Rate Structure (c/kWh) | | | | TOU Rate Structure (c/kWh) | | | | | Baseline & Off-Peak Credit, On-Peak Surcharge, Average Rate (c/kWh), Demand & Customer Charge, Minimum Bill ($/mo.) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | T1 | T2 | T3 | T4 | Sum On-Peak | Sum Mid-Peak | Sum Off-Peak | Win Mid-Peak | Win Off-Peak | Baseline Credit | TOU On-Peak Surcharge | TOU Part-Peak Surcharge | TOU Off-Peak Credit | Ave. Rate | Cust. Charge | Min. Bill |
| PG&E Rates (May 2013) | 8.3 | 9.6 | 14.0 | | | | | | | | | | | 9.7 | | 3.6 |
| ED Transitional Default 3-Tier | 8.8 | 13.1 | 19.0 | | | | | | | | | | | 10.7 | | 3.1 |
| ED End-State Default TOU | | | | | 23.5 | 14.1 | 9.4 | 11.3 | 9.4 | | | | | 11.3 | | 3.3 |
| ED End-State Optional 2-Tier | 11.2 | 13.5 | | | | | | | | | | | | 11.7 | | 3.3 |
| PG&E Transitional Default 4-Tier | 10.2 | 12.1 | 14.3 | 14.3 | | | | | | | | | | 12.1 | 4.0 | |
| PG&E Transitional Optional TOU T1 | | | | | 21.7 | 15.8 | 11.2 | 13.8 | 9.7 | 4.0 | | | | 14.5 | 4.0 | |
| PG&E Transitional Optional TOU T2 | | | | | 25.7 | 19.8 | 15.2 | 17.8 | 13.7 | | | | | 14.5 | 4.0 | |
| PG&E End-State Default 2-Tier | 12.1 | 14.6 | | | | | | | | | | | | 14.5 | 8.0 | |
| PG&E End-State Optional TOU | | | | | 20.6 | 15.9 | 12.2 | 14.3 | 11.0 | | | | | 14.8 | 8.0 | |
| DRA Transitional Default TOU | 9.0 | 11.0 | 21.6 | | | | | | | | 4.0 | | 0.6 | 10.6 | | 3.3 |
| DRA Transitional Optional 3-Tier | 9.0 | 11.0 | 21.6 | | | | | | | | | | | 10.5 | | 3.3 |
| DRA End-State Default TOU | | | | | 26.1 | 18.7 | 11.0 | 18.7 | 11.0 | 3.3 | | | | 11.9 | | 3.3 |
| DRA End-State Optional 2-Tier | 10.6 | 13.8 | | | | | | | | | | | | 11.7 | | 3.3 |
| TURN End-State Default 3-Tier | 7.9 | 14.7 | 14.7 | 21.3 | | | | | | | | | | N/A | | 3.6 |
| NRDC End-State Default TOU, Large Users, T2 | | | | | | | | | | | | | | | | |
| NRDC End-State Default TOU, Large Users, T3 | | | | | | | | | | | | | | | | |
| NRDC End-State Optional 3-Tier, Small Users | | | | | | | | | | | | | | | | |
| JSC Transitional Default 3-Tier | 8.3 | 9.6 | 12.5 | | | | | | | | | | | 9.3 | | |
| JSC End-State Default TOU T1 | | | | | 18.8 | 12.3 | 7.4 | 8.5 | 7.4 | | | | | 11.8 | | |
| JSC End-State Default TOU ≥T2 | | | | | 27.2 | 20.1 | 14.9 | 16.1 | 14.9 | | | | | 11.8 | | |
| JSC End-State Optional 3-Tier | 8.3 | 9.6 | 12.5 | | | | | | | | | | | 9.3 | | |
| Sierra Club End-State Default TOU T1 | | | | | 13.3 | 9.8 | 5.9 | 9.8 | 5.9 | | 10.0 | 3.0 | 4.9 | | | |
| Sierra Club End-State Default TOU T2 | | | | | 14.6 | 11.1 | 7.1 | 11.1 | 7.1 | | 10.0 | 3.0 | 4.9 | | | |
| Sierra Club End-State Default TOU T3 | | | | | 17.5 | 13.9 | 10.0 | 13.9 | 10.0 | | 10.0 | 3.0 | 4.9 | | | |
| Sierra Club End-State Optional 4-Tier | 8.3 | 9.6 | 14.0 | | | | | | | | | | | 9.7 | | 3.6 |

## Table 8-3

## Energy Division and Party Proposed Illustrative Rates – SCE Non-CARE

| Energy Division and Party Proposed Rate Designs - SCE Non-CARE | Tiered Rate Structure (c/kWh) | | | | TOU Rate Structure (c/kWh) | | | | | Baseline & Off-Peak Credit, On-Peak Surcharge, Average Rate (c/kWh), Customer Charge, Minimum Bill ($/mo.) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | T1 | T2 | T3 | T4 | Sum On-Peak | Sum Mid-Peak | Sum Off-Peak | Win Mid-Peak | Win Off-Peak | Baseline Credit | TOU On-Peak Surcharge | TOU Off-Peak Credit | Ave Rate [1] | Customer Charge | Minimum Bill |
| SCE Rates (April 2013) | 12.8 | 16.0 | 27.1 | 31.1 | | | | | | | | | N/A | 0.9 | |
| ED Transitional Default 3-Tier | 14.9 | 22.4 | 29.3 | | | | | | | | | | 19.8 | 0.9 | 5.0 |
| ED End-State Default TOU | | | | | 40.6 | 24.3 | 16.2 | 21.0 | 14.0 | | | | 19.4 | 0.9 | 5.0 |
| ED End-State Optional 2-Tier | 17.9 | 21.5 | | | | | | | | | | | 19.8 | 0.9 | 5.0 |
| SCE Transitional Default 3-Tier | 15.4 | 19.3 | 23.1 | | | | | | | | | | N/A | 5.0 | |
| SCE Transitional Optional TOU T1 | | | | | | | | | | | | | N/A | | |
| SCE End-State Default 2-Tier | 16.4 | 19.7 | | | | | | | | | | | N/A | | |
| SCE End-State Optional TOU, Small Users | | | | | 54.4 | 19.4 | 8.2 | 10.9 | 8.4 | | | | N/A | 20.0 | |
| SCE End-State Optional TOU, Large Users | | | | | 54.4 | 19.4 | 8.2 | 10.9 | 8.4 | | | | N/A | 30.0 | |
| DRA Transitional Default TOU | 14.0 | 22.4 | 28.0 | | | | | | | 4.0 | | 0.6 | 19.2 | 0.9 | |
| DRA Transitional Optional 3-Tier | 14.0 | 22.4 | 28.0 | | | | | | | | | | 19.2 | 0.9 | |
| DRA End-State Default TOU | | | | | 37.6 | 28.2 | 15.7 | 27.6 | 15.3 | 5.0 | | | 19.3 | 0.9 | |
| DRA End-State Optional 2-Tier | 16.6 | 21.6 | | | | | | | | | | | 19.1 | 0.9 | |
| TURN End-State Default 3-Tier | 15.8 | 21.0 | 25.8 | | | | | | | | | | N/A | 0.9 | |
| NRDC End-State Default TOU, Large Users, T2 | | | | | 18.0 | 12.0 | 6.0 | 12.0 | 6.0 | | 6.0 | | N/A | | |
| NRDC End-State Default TOU, Large Users T3 | | | | | 18.0 | 12.0 | 6.0 | 12.0 | 6.0 | | 12.0 | | N/A | | |
| NRDC End-State Optional 3-Tier, Small Users | 15.7 | 23.6 | 31.5 | | | | | | | | | | 18.2 [1] | | 4.5 |
| JSC Transitional Default 3-Tier | 13.0 | 16.0 | 30.4 | | | | | | | | | | 19.4 | | |
| JSC End-State Default TOU T1 | | | | | 40.2 | 17.4 | 14.3 | 15.5 | 12.6 | 6.4 | | | 19.5 | | |
| JSC End-State Default TOU ≥T2 | | | | | 46.6 | 23.8 | 20.7 | 21.9 | 19.0 | | | | 19.5 | | |
| JSC End-State Optional 3-Tier | 13.0 | 16.0 | 30.4 | | | | | | | | | | 19.4 | | |

## Table 8-4

## Energy Division and Party Proposed Illustrative Rates – SCE CARE

| Energy Division and Party Proposed Rate Designs - SCE CARE | Tiered Rate Structure (c/kWh) | | | | TOU Rate Structure (c/kWh) | | | | | Baseline & Off-Peak Credit, On-Peak Surcharge, Average Rate (c/kWh), Customer Charge, Minimum Bill ($/mo.) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | T1 | T2 | T3 | T4 | Sum On-Peak | Sum Mid-Peak | Sum Off-Peak | Win Mid-Peak | Win Off-Peak | Baseline Credit | TOU On-Peak Surcharge | TOU Off-Peak Credit | Average Rate | Customer Charge | Minimum Bill |
| SCE Rates (April 2013) | 8.5 | 10.7 | 20.7 | | | | | | | | | | N/A | 0.7 | |
| ED Transitional Default 3-Tier | 8.8 | 13.7 | 18.1 | | | | | | | | | | 11.3 | | 3.3 |
| ED End-State Default TOU | | | | | 25.5 | 14.9 | 9.7 | 12.8 | 8.2 | | | | 11.9 | | 3.3 |
| ED End-State Optional 2-Tier | 17.9 | 21.5 | | | | | | | | | | | 11.3 | | 3.3 |
| SCE Transitional Default 3-Tier | 11.6 | 14.6 | 17.6 | | | | | | | | | | N/A | 4.0 | |
| SCE Transitional Optional TOU T1 | | | | | | | | | | | | | N/A | | |
| SCE End-State Default 2-Tier | 12.2 | 14.8 | | | | | | | | | | | N/A | | |
| SCE End-State Optional TOU < 5kW | | | | | 43.5 | 15.5 | 6.6 | 8.7 | 6.7 | | | | N/A | 16.0 | |
| SCE End-State Optional TOU > 5kW | | | | | 43.5 | 15.5 | 6.6 | 8.7 | 6.7 | | | | N/A | 24.0 | |
| DRA Transitional Default TOU | 9.0 | 17.0 | 21.4 | | | | | | | | 4.0 | 0.6 | 12.8 | 0.7 | |
| DRA Transitional Optional 3-Tier | 9.0 | 17.0 | 21.4 | | | | | | | | | | 12.8 | 0.7 | |
| DRA End-State Default TOU | | | | | 27.4 | 20.3 | 10.9 | 19.8 | 10.6 | 5.0 | | | 12.6 | 0.7 | |
| DRA End-State Optional 2-Tier | 11.1 | 15.9 | | | | | | | | | | | 13.1 | | |
| TURN End-State Default 3-Tier | 8.1 | 15.1 | 23.7 | | | | | | | | | | N/A | 0.7 | |
| NRDC End-State Default TOU, Large Users, T1 | | | | | | | | | | | | | | | |
| NRDC End-State Default TOU, Large Users, T2 | | | | | | | | | | | | | | | |
| NRDC End-State Optional 3-Tier, Small Users | | | | | | | | | | | | | | | |
| JSC Transitional Default 3-Tier | 8.5 | 10.7 | 22.3 | | | | | | | | | | 12.4 | | |
| JSC End-State Default TOU T1 | | | | | 27.2 | 10.3 | 8.0 | 8.9 | 6.7 | 6.4 | | | 12.1 | | |
| JSC End-State Default TOU ≥T2 | | | | | 33.6 | 16.7 | 14.4 | 15.3 | 13.1 | | | | 12.1 | | |
| JSC End-State Optional 3-Tier | 8.5 | 10.7 | 22.3 | | | | | | | | | | 12.4 | | |

## Table 8-5

## Party Proposed Illustrative Rates – SDG&E Non-CARE TOU w/DDBSF[200]

| Party Proposed Rate Designs - SDG&E Non-CARE | Tiered Rate Structure (c/kWh) | | | TOU Rate Structure (c/kWh) | | | | | | Baseline & Off-Peak Credit, On-Peak Surcharge, Average Rate (c/kWh), Demand Charge, Minimum Bill ($/mo.) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | T1 | T2 | T3 | Sum On-Peak | Sum Mid-Peak | Sum Off-Peak | Win On-Peak | Win Mid-Peak | Win Off-Peak | Sum. Base. Credit (T1) | Sum. Base. Credit (T2) | Win. Base. Credit (T1) | Win. Base. Credit (T2) | TOU Off-Peak Credit | TOU On-Peak Surchrg. | Ave. Rate [1] | Min. Bill | 0-<3 kW Max Dem. | 3-<7 kW Max Dem. | ≤ 7 kW Max Dem. |
| SDG&E Rates (Sep. 2012) | | | | 30.0 | 30.0 | 30.0 | 28.2 | 28.2 | 28.2 | | | | | | | 19.7 | 5.0 | | | |
| SDG&E BSF TOU Trans. Step 1 | | | | 27.1 | 25.6 | 24.0 | 22.9 | 22.0 | 20.7 | -10.9 | -8.6 | -7.1 | -4.9 | | | 19.4 | | 3.0 | 6.0 | 13.0 |
| SDG&E BSF TOU Trans. Step 2 | | | | 25.2 | 19.6 | 18.0 | 17.9 | 16.9 | 15.6 | -5.8 | | -2.0 | | | | 19.2 | | 6.0 | 12.0 | 23.0 |
| SDG&E BSF TOU Trans. Step 3 | | | | 24.7 | 15.0 | 13.4 | 14.2 | 13.2 | 12.0 | | | | | | | 19.1 | | 9.0 | 18.0 | 39.1 |
| SDG&E BSF TOU Trans. Step 4 | | | | 26.4 | 12.5 | 10.9 | 12.7 | 11.7 | 10.5 | | | | | | | 19.1 | | 12.0 | 24.0 | 52.1 |
| SDG&E BSF TOU End-State Step 5 | | | | 28.2 | 10.3 | 8.7 | 11.4 | 10.4 | 9.1 | | | | | | | 19.2 | | 15.0 | 30.0 | 65.2 |
| DRA Trans. Default TOU | 13.8 | 21.6 | 29.9 | | | | | | | 4.0 | | | | 4.0 | 0.9 | N/A | 5.0 | | | |
| DRA Trans. Optional 3-Tier | 14.3 | 22.1 | 30.4 | | | | | | | | | | | | | N/A | 5.0 | | | |
| DRA End-State Default TOU | | | | 37.7 | 23.4 | 17.6 | N/A | 23.0 | 18.0 | 5.0 | | 5.0 | | | | N/A | 5.0 | | | |
| DRA End-State Optional 2-Tier | 17.1 | 22.1 | | | | | | | | | | | | | | N/A | 5.0 | | | |
| TURN End-State Default 3-Tier | 15.7 | 21.2 | 25.4 | | | | | | | | | | | | | N/A | 5.0 | | | |
| NRDC End-State Default TOU, Large Users, T2 | | | | 18.0 | 12.0 | 6.0 | N/A | 12.0 | 6.0 | | | | | | 6.0 | N/A | | | | |
| NRDC End-State Default TOU, Large Users T3 | | | | 18.0 | 12.0 | 6.0 | N/A | 12.0 | 6.0 | | | | | | 12.0 | N/A | | | | |
| NRDC End-State Optional 3-Tier, Small Users | 15.7 | 23.6 | 31.5 | | | | | | | | | | | | | 18.2 [1] | 4.5 | | | |
| JSC Trans. Default 3-Tier Sum. | 14.3 | 16.6 | 29.2 | | | | | | | | | | | | | 19.7 | | | | |
| JSC Trans. Default 3-Tier Win. | 14.3 | 16.6 | 27.3 | | | | | | | | | | | | | 19.7 | | | | |
| JSC End-State Default TOU T1 | | | | 21.4 | 17.7 | 14.1 | 14.6 | 13.5 | 12.4 | 10.0 | | 10.0 | | | | 19.7 | | | | |
| JSC End-State Default TOU ≥T2 | | | | 31.4 | 27.7 | 24.1 | 24.6 | 23.5 | 22.4 | | | | | | | 19.7 | | | | |
| JSC End-State Optional 3-Tier Sum. | 14.3 | 16.6 | 29.2 | | | | | | | | | | | | | 19.7 | | | | |
| JSC End-State Optional 3-Tier Win. | 14.3 | 16.6 | 27.3 | | | | | | | | | | | | | 19.7 | | | | |

[200] DDBSF refers to a demand differentiated basic service fee or customer charge

## Table 8-6

## Party Proposed Illustrative Rates – SDG&E CARE TOU w/DDBSF

| Party Proposed Rate Designs - SDG&E CARE | Tiered Rate Structure (c/kWh) | | | TOU Rate Structure (c/kWh) | | | | | | Baseline & Off-Peak Credit, On-Peak Surcharge, Average Rate (c/kWh), Demand Charge, Minimum Bill ($/mo.) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Tier 1 | Tier 2 | Tier 3 | Sum On-Peak | Sum Mid-Peak | Sum Off-Peak | Win On-Peak | Win Mid-Peak | Win Off-Peak | Sum. Base. Credit (T1) | Sum. Base. Credit (T2) | Win. Base. Credit (T1) | Win. Base. Credit (T2) | TOU Off-Peak Credit | TOU On-Peak Surchrg. | Ave. Rate | Min. Bill | 0-<3 kW Max Dem. | 3-<7 kW Max Dem. | ≤ 7 kW Max Dem. |
| SDG&E Rates (Sep. 2012) | | | | 17.6 | 17.6 | 17.6 | 16.4 | 16.4 | 16.4 | | | | | | | 11.6 | 4.0 | | | |
| SDG&E BSF TOU Trans. Step 1 | | | | 16.8 | 15.6 | 14.4 | 14.2 | 13.4 | 12.4 | -5.3 | -3.7 | -3.0 | -1.4 | | | 12.3 | | 2.4 | 4.8 | 10.4 |
| SDG&E BSF TOU Trans. Step 2 | | | | 16.7 | 12.2 | 10.9 | 11.4 | 10.7 | 9.6 | -2.7 | | -0.3 | | | | 13.0 | | 4.8 | 9.6 | 20.9 |
| SDG&E BSF TOU Trans. Step 3 | | | | 17.6 | 9.8 | 8.5 | 9.6 | 8.9 | 7.8 | | | | | | | 13.6 | | 7.2 | 14.4 | 31.3 |
| SDG&E BSF TOU Trans. Step 4 | | | | 19.0 | 8.0 | 6.7 | 8.6 | 7.8 | 6.8 | | | | | | | 13.8 | | 9.6 | 19.2 | 24.0 |
| SDG&E BSF TOU End-State | | | | 20.7 | 6.3 | 5.1 | 7.7 | 6.9 | 5.9 | | | | | | | 14.2 | | 12.0 | 24.0 | 52.1 |
| DRA Transitional Default TOU | 9.9 | 11.6 | 17.5 | | | | | | | | | | | 3.1 | 0.7 | N/A | 4.0 | | | |
| DRA Transitional Optional 3-Tier | 9.8 | 15.9 | 22.1 | | | | | | | | | | | | | N/A | 4.0 | | | |
| DRA End-State Default TOU | | | | 29.8 | 17.1 | 11.9 | | 16.7 | 12.2 | 4.5 | | 4.5 | | | | N/A | 3.5 | | | |
| DRA End-State Optional 2-Tier | 11.7 | 16.1 | | | | | | | | | | | | | | N/A | | | | |
| TURN End-State Default 3-Tier | 7.5 | 14.4 | 22.2 | | | | | | | | | | | | | N/A | 4.0 | | | |
| NRDC End-State Default TOU, Large Users, T2 | | | | | | | | | | | | | | | | | | | | |
| NRDC End-State Default TOU, Large Users T3 | | | | | | | | | | | | | | | | | | | | |
| NRDC End-State Optional 3-Tier, Small Users | | | | | | | | | | | | | | | | | | | | |
| JSC Transitional Default 3-Tier Sum. | 12.7 | 14.8 | 22.2 | | | | | | | | | | | | | 14.8 | | | | |
| JSC Transitional Default 3-Tier Win. | 12.7 | 14.8 | 20.8 | | | | | | | | | | | | | 14.8 | | | | |
| JSC End-State Default TOU T1 | | | | 14.1 | 11.2 | 8.3 | 8.6 | 7.8 | 6.9 | 8.0 | | 8.0 | | | | N/A | | | | |
| JSC End-State Default TOU ≥T2 | | | | 22.1 | 19.2 | 16.3 | 16.6 | 15.8 | 14.9 | | | | | | | N/A | | | | |
| JSC End-State Optional 3-Tier Sum. | 12.7 | 14.8 | 22.2 | | | | | | | | | | | | | 14.8 | | | | |
| JSC End-State Optional 3-Tier Win. | 12.7 | 14.8 | 20.8 | | | | | | | | | | | | | 14.8 | | | | |

## Table 8-7

## Party Proposed Illustrative Rates – SDG&E Non-CARE TOU w/BSF[201]

| Party Proposed Rate Designs - SDG&E Non-CARE | TOU Rate Structure (c/kWh) | | | TOU Rate Structure (c/kWh) | | | | | | Baseline & Off-Peak Credit, On-Peak Surcharge, Average Rate (c/kWh), Customer Charge, Minimum Bill ($/mo.) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | T1 | T2 | T3 | Sum On-Peak | Sum Mid-Peak | Sum Off-Peak | Win On-Peak | Win Mid-Peak | Win Off-Peak | Summer Base. Credit (T1) | Summer Base. Credit (T2) | Winter Base. Credit (T1) | Winter Base. Credit (T2) | TOU Off-Peak Credit | TOU On-Peak Surchrg. | Ave. Rate [1] | Cust. Charge | Min. Bill |
| SDG&E Rates (Sep. 2012) | | | | 30.0 | 30.0 | 30.0 | 28.2 | 28.2 | 28.2 | -15.6 | -16.4 | -13.9 | -11.7 | | | 19.7 | | 5.0 |
| SDG&E BSF TOU Trans. Step 1 | | | | 27.3 | 25.8 | 24.2 | 23.1 | 22.2 | 20.9 | -11.1 | -8.8 | -7.3 | -5.1 | | | 19.4 | 7.4 | |
| SDG&E BSF TOU Trans. Step 2 | | | | 25.2 | 19.6 | 18.0 | 17.8 | 16.9 | 15.6 | -5.8 | | -2.0 | | | | 19.1 | 15.4 | |
| SDG&E BSF TOU Trans. Step 3 | | | | 24.7 | 15.0 | 13.4 | 14.2 | 13.2 | 12.0 | | | | | | | 18.9 | 23.1 | |
| SDG&E BSF TOU Trans. Step 4 | | | | 26.3 | 12.5 | 10.9 | 12.6 | 11.7 | 10.4 | | | | | | | 18.8 | 30.7 | |
| SDG&E BSF TOU End-State Step 5 | | | | 28.2 | 10.3 | 8.7 | 11.4 | 10.4 | 9.2 | | | | | | | 19.0 | 38.4 | |
| DRA Transitional Default TOU | 13.8 | 21.6 | 29.9 | | | | | | | | | | | 4.0 | 0.9 | N/A | | 5.0 |
| DRA Transitional Optional 3-Tier | 14.3 | 22.1 | 30.4 | | | | | | | | | | | | | N/A | | 5.0 |
| DRA End-State Default TOU | | | | 37.7 | 23.4 | 17.6 | | 23.0 | 18.0 | 5.0 | | 5.0 | | | | N/A | | 5.0 |
| DRA End-State Optional 2-Tier | 17.1 | 22.1 | | | | | | | | | | | | | | N/A | | 5.0 |
| TURN End-State Default 3-Tier | 15.7 | 21.2 | 25.4 | | | | | | | | | | | | | | | 5.0 |
| NRDC End-State Default TOU, Large Users, T2 | | | | 18.0 | 12.0 | 6.0 | N/A | 12.0 | 6.0 | | | | | | 6.0 | N/A | | |
| NRDC End-State Default TOU, Large Users T3 | | | | 18.0 | 12.0 | 6.0 | N/A | 12.0 | 6.0 | | | | | | 12.0 | N/A | | |
| NRDC End-State Optional 3-Tier, Small Users | 15.7 | 23.6 | 31.5 | | | | | | | | | | | | | 18.2 | | 4.5 |
| JSC Transitional Default 3-Tier Summer | 14.3 | 16.6 | 29.2 | | | | | | | | | | | | | 19.7 | | |
| JSC Transitional Default 3-Tier Winter | 14.3 | 16.6 | 27.3 | | | | | | | | | | | | | 19.7 | | |
| JSC End-State Default TOU T1 | | | | 21.4 | 17.7 | 14.1 | 14.6 | 13.5 | 12.4 | 10.0 | | 10.0 | | | | 19.7 | | |
| JSC End-State Default TOU ≥T2 | | | | 31.4 | 27.7 | 24.1 | 24.6 | 23.5 | 22.4 | | | | | | | 19.7 | | |
| JSC End-State Optional 3-Tier Summer | 14.3 | 16.6 | 29.2 | | | | | | | | | | | | | 19.7 | | |
| JSC End-State Optional 3-Tier Winter | 14.3 | 16.6 | 27.3 | | | | | | | | | | | | | 19.7 | | |

[201] BSF refers to a basic service fee (customer charge).

## Table 8-8
## Party Proposed Illustrative Rates – SDG&E CARE TOU w/BSF

| Party Proposed Rate Designs - SDG&E CARE | TOU Rate Structure (c/kWh) | | | TOU Rate Structure (c/kWh) | | | | | | Baseline & Off-Peak Credit, On-Peak Surcharge, Average Rate (c/kWh), Customer Charge, Minimum Bill ($/mo.) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | T1 | T2 | T3 | Sum On-Peak | Sum Mid-Peak | Sum Off-Peak | Win On-Peak | Win Mid-Peak | Win Off-Peak | Summer Base. Credit (T1) | Summer Base. Credit (T2) | Winter Base. Credit (T1) | Winter Base. Credit (T2) | TOU Off-Peak Credit | TOU On-Peak Surchrg. | Ave. Rate | Cust. Charge | Min. Bill |
| SDG&E Rates (Sep. 2012) | | | | 17.6 | 17.6 | 17.6 | 16.4 | 16.4 | 16.4 | -7.6 | -5.9 | -6.5 | -4.8 | | | 11.6 | | 4.0 |
| SDG&E BSF TOU Trans. Step 1 | | | | 16.8 | 15.6 | 14.4 | 14.2 | 13.4 | 12.4 | -5.3 | -3.7 | -3.0 | -1.4 | | | 12.3 | 5.9 | |
| SDG&E BSF TOU Trans. Step 2 | | | | 16.7 | 12.2 | 10.9 | 11.4 | 10.7 | 9.6 | -2.7 | | -0.3 | | | | 13.0 | 12.3 | |
| SDG&E BSF TOU Trans. Step 3 | | | | 17.6 | 9.8 | 8.5 | 9.6 | 8.9 | 7.8 | | | | | | | 13.6 | 18.4 | |
| SDG&E BSF TOU Trans. Step 4 | | | | 19.0 | 8.0 | 6.7 | 8.6 | 7.8 | 6.8 | | | | | | | 13.8 | 30.7 | |
| SDG&E BSF TOU End-State Step 5 | | | | 20.7 | 6.3 | 5.1 | 7.7 | 6.9 | 5.9 | | | | | | | 14.2 | 30.7 | |
| DRA Transitional Default TOU | 9.9 | 11.6 | 17.5 | | | | | | | | | | | 3.1 | 0.7 | N/A | | 4.0 |
| DRA Transitional Optional 3-Tier | 9.8 | 15.9 | 22.1 | | | | | | | | | | | | | N/A | | 4.0 |
| DRA End-State Default TOU | | | | 29.8 | 17.1 | 11.9 | N/A | 16.7 | 12.2 | 4.5 | | 4.5 | | | | N/A | | 3.5 |
| DRA End-State Optional 2-Tier | 11.7 | 16.1 | | | | | | | | | | | | | | N/A | | |
| TURN End-State Default 3-Tier | 7.5 | 14.4 | 22.2 | | | | | | | | | | | | | | | 4.0 |
| NRDC End-State Default TOU, Large Users, T2 | | | | | | | | | | | | | | | | | | |
| NRDC End-State Default TOU, Large Users T3 | | | | | | | | | | | | | | | | | | |
| NRDC End-State Optional 3-Tier, Small Users | | | | | | | | | | | | | | | | | | |
| JSC Transitional Default 3-Tier Sum. | 12.7 | 14.8 | 22.2 | | | | | | | | | | | | | 14.8 | | |
| JSC Transitional Default 3-Tier Win. | 12.7 | 14.8 | 20.8 | | | | | | | | | | | | | 14.8 | | |
| JSC End-State Default TOU T1 | | | | 14.1 | 11.2 | 8.3 | 8.6 | 7.8 | 6.9 | 8.0 | | 8.0 | | | | N/A | | |
| JSC End-State Default TOU >T2 | | | | 22.1 | 19.2 | 16.3 | 16.6 | 15.8 | 14.9 | | | | | | | N/A | | |
| JSC End-State Optional 3-Tier Sum. | 12.7 | 14.8 | 22.2 | | | | | | | | | | | | | 14.8 | | |
| JSC End-State Optional 3-Tier Win. | 12.7 | 14.8 | 20.8 | | | | | | | | | | | | | 14.8 | | |

## Table 8-9

## Party Proposed Illustrative Rates – SDG&E Non-CARE Tiered Rate w/DDBSF

| Party Proposed Rate Designs - SDG&E Non-CARE | Tiered Rate Structure (c/kWh) | | | | TOU Rate Structure (c/kWh) | | | | | | Baseline & Off-Peak Credit, On-Peak Surcharge, Average Rate (c/kWh), Demand Charge, Minimum Bill ($/mo.) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | T1 | T2 | T3 | T4 | Sum On-Peak | Sum Mid-Peak | Sum Off-Peak | Win On-Peak | Win Mid-Peak | Win Off-Peak | Sum. Base. Credit (T1) | Sum. Base. Credit (T2) | Win. Base. Credit (T1) | Win. Base. Credit (T2) | TOU Off-Peak Credit | TOU On-Peak Surchrg. | Ave. Rate | Min. Bill | 0-<3 kW Max Dem. | 3-<7 kW Max Dem. | ≤ 7 kW Max Dem. |
| SDG&E Rates (Sep. 2012) | 14.3 | 16.6 | 28.0 | 30.0 | | | | | | | | | | | | | 19.7 | 5.0 | | | |
| SDG&E BSF TOU Trans. Step 1 | 14.3 | 16.6 | 25.2 | | | | | | | | | | | | | | 19.4 | | 3.0 | 6.0 | 13.0 |
| SDG&E BSF TOU Trans. Step 2 | 14.3 | 20.2 | | | | | | | | | | | | | | | 19.2 | | 6.0 | 12.0 | 13.0 |
| SDG&E BSF TOU Trans. Step 3 | 16.5 | | | | | | | | | | | | | | | | 19.1 | | 9.0 | 18.0 | 39.1 |
| SDG&E BSF TOU Trans. Step 4 | 15.0 | | | | | | | | | | | | | | | | 19.1 | | 12.0 | 24.0 | 52.1 |
| SDG&E BSF TOU End-State Step 5 | 13.7 | | | | | | | | | | | | | | | | 19.2 | | 15.0 | 30.0 | 65.2 |
| DRA Trans. Default TOU | 13.8 | 21.6 | 29.9 | | | | | | | | | | | | 4.0 | 0.9 | N/A | 5.0 | | | |
| DRA Trans. Optional 3-Tier | 14.3 | 22.1 | 30.4 | | | | | | | | | | | | | | N/A | 5.0 | | | |
| DRA End-State Default TOU | | | | 37.7 | 23.4 | 17.6 | N/A | 23.0 | 18.0 | | 5.0 | | 5.0 | | | | N/A | 5.0 | | | |
| DRA End-State Optional 2-Tier | 17.1 | 22.1 | | | | | | | | | | | | | | | N/A | 5.0 | | | |
| TURN End-State Default 3-Tier | 15.7 | 21.2 | 25.4 | | | | | | | | | | | | | | N/A | 5.0 | | | |
| NRDC End-State Default TOU, Large Users, T2 | | | | | 18.0 | 12.0 | 6.0 | N/A | 12.0 | 6.0 | | | | | | | N/A | | | | |
| NRDC End-State Default TOU, Large Users T3 | | | | | 18.0 | 12.0 | 6.0 | N/A | 12.0 | 6.0 | | | | | | | N/A | | | | |
| NRDC End-State Optional 3-Tier, Small Users | 15.7 | 23.6 | 31.5 | | | | | | | | | | | | | | 18.2 | 4.5 | | | |
| JSC Trans. Default 3-Tier Sum. | 14.3 | 16.6 | 29.2 | | | | | | | | | | | | | | 19.7 | | | | |
| JSC Trans. Default 3-Tier Win. | 14.3 | 16.6 | 27.3 | | | | | | | | | | | | | | 19.7 | | | | |
| JSC End-State Default TOU T1 | | | | | 21.4 | 17.7 | 14.1 | 14.6 | 13.5 | 12.4 | 10.0 | | 10.0 | | | | 19.7 | | | | |
| JSC End-State Default TOU ≥T2 | | | | | 31.4 | 27.7 | 24.1 | 24.6 | 23.5 | 22.4 | 10.0 | | 10.0 | | | | 19.7 | | | | |
| JSC End-State Optional 3-Tier Sum. | 14.3 | 16.6 | 29.2 | | | | | | | | | | | | | | 19.7 | | | | |
| JSC End-State Optional 3-Tier Win. | 14.3 | 16.6 | 27.3 | | | | | | | | | | | | | | 19.7 | | | | |

## Table 8-10

## Party Proposed Illustrative Rates – SDG&E CARE Tiered Rate w/DDBSF

| Party Proposed Rate Designs - SDG&E CARE | Tiered Rate Structure (c/kWh) | | | | TOU Rate Structure (c/kWh) | | | | | | Baseline & Off-Peak Credit, On-Peak Surcharge, Average Rate (c/kWh), Demand Charge, Minimum Bill ($/mo.) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | T1 | T2 | T3 | T4 | Sum On-Peak | Sum Mid-Peak | Sum Off-Peak | Win On-Peak | Win Mid-Peak | Win Off-Peak | Sum. Base. Credit (T1) | Sum. Base. Credit (T2) | Win. Base. Credit (T1) | Win. Base. Credit (T2) | TOU Off-Peak Credit | TOU On-Peak Surchrg. | Ave. Rate | Min. Bill | 0-<3 kW Max Dem. | 3-<7 kW Max Dem. | ≤7 kW Max Dem. |
| SDG&E Current (Sep. 2012) | 10.0 | 11.6 | 17.5 | | | | | | | | | | | | | | 11.6 | 4.0 | | | |
| SDG&E BSF TOU Trans. Step 1 | 10.0 | 11.6 | 15.3 | | | | | | | | | | | | | | 12.3 | | 2.4 | 4.8 | 10.4 |
| SDG&E BSF TOU Trans. Step 2 | 10.0 | 12.6 | | | | | | | | | | | | | | | 13.0 | | 4.8 | 9.6 | 20.9 |
| SDG&E BSF TOU Trans. Step 3 | 11.0 | | | | | | | | | | | | | | | | 13.6 | | 7.2 | 14.4 | 31.3 |
| SDG&E BSF TOU Trans. Step 4 | 10.0 | | | | | | | | | | | | | | | | 13.8 | | 9.6 | 19.2 | 41.7 |
| SDG&E BSF TOU End-State Step 5 | 9.1 | | | | | | | | | | | | | | | | 14.2 | | 12.0 | 24.0 | 52.1 |
| DRA Transitional Default TOU | 9.9 | 11.6 | 17.5 | | | | | | | | | | | | 3.1 | 0.7 | N/A | 4.0 | | | |
| DRA Transitional Optional 3-Tier | 9.8 | 15.9 | 22.1 | | | | | | | | | | | | | | N/A | 4.0 | | | |
| DRA End-State Default TOU | | | | 29.8 | 17.1 | 11.9 | | 16.7 | 12.2 | | 4.5 | | 4.5 | | | | N/A | 3.5 | | | |
| DRA End-State Optional 2-Tier | 11.7 | 16.1 | | | | | | | | | | | | | | | | | | | |
| TURN End-State Default 3-Tier | 7.5 | 14.4 | 22.2 | | | | | | | | | | | | | | | 4.0 | | | |
| NRDC End-State Default TOU, Large Users, T2 | | | | | | | | | | | | | | | | | | | | | |
| NRDC End-State Default TOU, Large Users T3 | | | | | | | | | | | | | | | | | | | | | |
| NRDC End-State Optional 3-Tier, Small Users | | | | | | | | | | | | | | | | | | | | | |
| JSC Trans. Default 3-Tier Sum. | 12.7 | 14.8 | 22.2 | | | | | | | | | | | | | | 14.8 | | | | |
| JSC Trans. Default 3-Tier Win. | 12.7 | 14.8 | 20.8 | | | | | | | | | | | | | | 14.8 | | | | |
| JSC End-State Default TOU T1 | | | | | 14.1 | 11.2 | 8.3 | 8.6 | 7.8 | 6.9 | 8.0 | | 8.0 | | | | N/A | | | | |
| JSC End-State Default TOU ≥T2 | | | | | 22.1 | 19.2 | 16.3 | 16.6 | 15.8 | 14.9 | 8.0 | | 8.0 | | | | N/A | | | | |
| JSC End-State Optional 3-Tier Sum. | 12.7 | 14.8 | 22.2 | | | | | | | | | | | | | | 14.8 | | | | |
| JSC End-State Optional 3-Tier Win. | 12.7 | 14.8 | 20.8 | | | | | | | | | | | | | | 14.8 | | | | |

## Table 8-11

## Party Proposed Illustrative Rates – SDG&E Non-CARE Tiered Rate w/BSF

| Party Proposed Rate Designs - SDG&E Non-CARE | Tiered Rate Structure (c/kWh) | | | | TOU Rate Structure (c/kWh) | | | | | | Baseline & Off-Peak Credit, On-Peak Surcharge, Average Rate (c/kWh), Customer Charge, Minimum Bill ($/mo.) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | T1 | T2 | T3 | T4 | Sum On-Peak | Sum Mid-Peak | Sum Off-Peak | Win On-Peak | Win Mid-Peak | Win Off-Peak | Sum. Base. Credit (T1) | Sum. Base. Credit (T2) | Win. Base. Credit (T1) | Win. Base. Credit (T2) | TOU Off-Peak Credit | TOU On-Peak Surchrg. | Ave. Rate | Cust. Charge | Min. Bill |
| SDG&E Rates (Sep. 2012) | 14.3 | 16.6 | 28.0 | 30.0 | | | | | | | | | | | | | 19.7 | | 5.0 |
| SDG&E BSF Flat Trans. Step 1 | 14.3 | 16.6 | 25.4 | 25.4 | | | | | | | | | | | | | 19.4 | 7.4 | |
| SDG&E BSF Flat Trans. Step 2 | 14.3 | 20.1 | | | | | | | | | | | | | | | 19.1 | 15.4 | |
| SDG&E BSF Flat Trans. Step 3 | 16.5 | | | | | | | | | | | | | | | | 18.9 | 23.1 | |
| SDG&E BSF Flat Trans. Step 4 | 14.9 | | | | | | | | | | | | | | | | 18.8 | 30.7 | |
| SDG&E BSF Flat End-State Step 5 | 13.7 | | | | | | | | | | | | | | | | 19.0 | 38.4 | |
| DRA Transitional Default TOU | 13.8 | 21.6 | 29.9 | | | | | | | | | | | | 4.0 | 0.9 | N/A | | 5.0 |
| DRA Transitional Optional 3-Tier | 14.3 | 22.1 | 30.4 | | | | | | | | | | | | | | N/A | | 5.0 |
| DRA End-State Default TOU | | | | | 37.7 | 23.4 | 17.6 | | 23.0 | 18.0 | 5.0 | | 5.0 | | | | N/A | | 5.0 |
| DRA End-State Optional 2-Tier | 17.1 | 22.1 | | | | | | | | | | | | | | | N/A | | 5.0 |
| TURN End-State Default 3-Tier | 15.7 | 21.2 | 25.4 | | | | | | | | | | | | | | | | 5.0 |
| NRDC End-State Default TOU, Large Users, T2 | | | | | 18.0 | 12.0 | 6.0 | N/A | 12.0 | 6.0 | | | | | | | N/A | | |
| NRDC End-State Default TOU, Large Users T3 | | | | | 18.0 | 12.0 | 6.0 | N/A | 12.0 | 6.0 | | | | | | | N/A | | |
| NRDC End-State Optional 3-Tier, Small Users | 15.7 | 23.6 | 31.5 | | | | | | | | | | | | | | 18.2 [1] | | 4.5 |
| JSC Transitional Default 3-Tier Sum. | 14.3 | 16.6 | 29.2 | | | | | | | | | | | | | | 19.7 | | |
| JSC Transitional Default 3-Tier Win. | 14.3 | 16.6 | 27.3 | | | | | | | | | | | | | | 19.7 | | |
| JSC End-State Default TOU T1 | | | | | 21.4 | 17.7 | 14.1 | 14.6 | 13.5 | 12.4 | 10.0 | | 10.0 | | | | 19.7 | | |
| JSC End-State Default TOU ≥T2 | | | | | 31.4 | 27.7 | 24.1 | 24.6 | 23.5 | 22.4 | | | | | | | 19.7 | | |
| JSC End-State Optional 3-Tier Sum. | 14.3 | 16.6 | 29.2 | | | | | | | | | | | | | | 19.7 | | |
| JSC End-State Optional 3-Tier Win. | 14.3 | 16.6 | 27.3 | | | | | | | | | | | | | | 19.7 | | |

## Table 8-12

## Party Proposed Illustrative Rates – SDG&E CARE Tiered Rate w/BSF

| | Tiered Rate Structure (c/kWh) | | | | TOU Rate Structure (c/kWh) | | | | | | Baseline & Off-Peak Credit, On-Peak Surcharge, Average Rate (c/kWh), Customer Charge, Minimum Bill ($/mo.) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Party Proposed Rate Designs - SDG&E CARE | T1 | T2 | T3 | T4 | Sum On-Peak | Sum Mid-Peak | Sum Off-Peak | Win On-Peak | Win Mid-Peak | Win Off-Peak | Sum. Base. Credit (T1) | Sum. Base. Credit (T2) | Win. Base. Credit (T1) | Win. Base. Credit (T2) | TOU Off-Peak Credit | TOU On-Peak Surchrg. | Ave. Rate | Cust. Charge | Min. Bill |
| SDG&E Rates (Sep. 2012) | 10.0 | 11.6 | 17.5 | | | | | | | | | | | | | | 11.6 | | 4.0 |
| SDG&E BSF Flat Trans. Step 1 | 10.0 | 11.6 | 15.4 | | | | | | | | | | | | | | 12.4 | 5.9 | |
| SDG&E BSF Flat Trans. Step 2 | 10.0 | 12.6 | | | | | | | | | | | | | | | 13.4 | 12.3 | |
| SDG&E BSF Flat Trans. Step 3 | 11.0 | | | | | | | | | | | | | | | | 14.2 | 18.4 | |
| SDG&E BSF Flat Trans. Step 4 | 9.9 | | | | | | | | | | | | | | | | 14.6 | 24.6 | |
| SDG&E BSF Flat End-State Step 5 | 9.1 | | | | | | | | | | | | | | | | 15.2 | 30.7 | |
| DRA Transitional Default TOU | 9.9 | 11.6 | 17.5 | | | | | | | | | | | | 3.1 | 0.7 | N/A | | 4.0 |
| DRA Transitional Optional 3-Tier | 9.8 | 15.9 | 22.1 | | | | | | | | | | | | | | N/A | | 4.0 |
| DRA End-State Default TOU | | | | 29.8 | 17.1 | 11.9 | | 16.7 | 12.2 | | 4.5 | | 4.5 | | | | N/A | | 3.5 |
| DRA End-State Optional 2-Tier | 11.7 | 16.1 | | | | | | | | | | | | | | | N/A | | |
| TURN End-State Default 3-Tier | 7.5 | 14.4 | 22.2 | | | | | | | | | | | | | | N/A | | 4.0 |
| NRDC End-State Default TOU, Large Users, T2 | | | | | | | | | | | | | | | | | | | |
| NRDC End-State Default TOU, Large Users T3 | | | | | | | | | | | | | | | | | | | |
| NRDC End-State Optional 3-Tier, Small Users | | | | | | | | | | | | | | | | | | | |
| JSC Transitional Default 3-Tier Sum. | 12.7 | 14.8 | 22.2 | | | | | | | | | | | | | | 14.8 | | |
| JSC Transitional Default 3-Tier Win. | 12.7 | 14.8 | 20.8 | | | | | | | | | | | | | | 14.8 | | |
| JSC End-State Default TOU T1 | | | | | 14.1 | 11.2 | 8.3 | 8.6 | 7.8 | 6.9 | 8.0 | | 8.0 | | | | N/A | | |
| JSC End-State Default TOU >T2 | | | | | 22.1 | 19.2 | 16.3 | 16.6 | 15.8 | 14.9 | | | | | | | N/A | | |
| JSC End-State Optional 3-Tier Sum. | 12.7 | 14.8 | 22.2 | | | | | | | | | | | | | | 14.8 | | |
| JSC End-State Optional 3-Tier Win. | 12.7 | 14.8 | 20.8 | | | | | | | | | | | | | | 14.8 | | |